

**COMMERCIAL IN CONFIDENCE**

Delta Electricity

# **Project Symphony – Mt Piper**

**Stage 2 Environmental Site Assessment**

Ref: 0207423RP01

August 2014

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*Stage 2 Environmental Site Assessment*

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Environmental Resources Management Australia Pty Ltd Quality System

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## **EXECUTIVE SUMMARY**

*Environmental Resources Management Australia Pty Ltd (ERM) was commissioned by Delta Electricity to undertake a Phase 2 Environmental Site Assessment (Phase 2 ESA) at Mt. Piper Power Station (herein referred to as the "Site") in accordance with the work scope presented in the Preliminary Environmental Site Assessment (PESA; ERM Reference 01947098RP03, 24 July 2013) prepared by ERM.*

*The primary objective for the Phase 2 ESA was to gather soil, sediment, surface water and groundwater data in order to develop a baseline assessment of environmental conditions at the Site, as at or near the time of the transaction. Data obtained during completion of this Phase 2 ESA may also be used to inform future management of contamination at the Site.*

### **Investigation Methodology**

*To achieve the stated objectives, ERM collected soil, sediment, surface water and groundwater samples and submitted those collected samples to environmental laboratories for analysis of Constituents of Potential Concern (COPCs). A Conceptual Site Model (CSM) developed for the Site during the PESA was further refined and the analytical data was compared against published environmental screening values to assess potential risks to human health and the environment.*

*The following conclusions were made based on the data collected during the investigation.*

### **Investigation Outcomes**

- The impacts identified in soil and groundwater at the sites are unlikely to represent a risk to human health and/or the environment given appropriate ongoing management based on the current and continued use of the Site as a Power Station.*
- The key impacts identified included certain metals in groundwater, hydrocarbons and Light non-Aqueous Phase Liquid (LNAPL) in groundwater in the Mobile Plant Refuelling Area and benzene in groundwater near a UST.*
- Certain metals were identified at concentrations in excess of human health and/or ecological screening values across the Site. However the concentrations of metals in groundwater across the Site are generally comparable to background groundwater quality. Where metals were above background concentrations, impact generally appears to be associated with contributions from former mine workings both on the Site and in surrounding areas.*

Site Management and Remediation Requirements

- *No contamination issues were identified which would require material management or remediation based on the current and continued use of the Site as a Power Station with the potential exception of the identified hydrocarbon impacts in soil and groundwater surrounding the Mobile Plant Refuelling Area. On the basis of the data available to ERM at the time of this assessment, the potential for vapour inhalation risks to industrial workers and/or intrusive maintenance workers in this area could not be ruled out. However, ERM understands that the current site operator (Energy Australia) (and prior to the transaction Delta Electricity) has been developing appropriate management approaches in relation to this issue alongside independent consultants and regulators. It is noted that Delta Electricity has previously notified this issue to NSW EPA. It is considered that the costs for management of this issue may be potentially material depending on the remediation / management option selected.*
- *It is recommended that the grit blasting impacts to surface observed in the former contractors' yard in the Non-Operational Area be removed as part of general housekeeping. The costs associated with these works are not anticipated to be material.*
- *Whilst some further assessment may be required to undertake confirmatory sampling in various areas of the Site (refer to "Additional Baseline Data Recommendations" below), it is considered unlikely that costs related to this work would exceed the adopted material threshold for the purposes of this assessment (A\$ 0.5 million).*

Requirements under the Contaminated Land Management (CLM) Act 1997

*With regard to the duty to report contamination which exists under the CLM Act (1997) and the potential for regulation, ERM notes the following:*

- *ERM considers that NSW EPA would most likely continue to manage the LNAPL issue under the existing notification of potential contamination under the CLM Act, however, the additional results should be provided to NSW EPA for review and consideration.*
- *ERM considers that NSW EPA would most likely continue to manage the metals in groundwater issue under the POEO Act (1997) via the Site EPL (including the existing groundwater and surface water monitoring and reporting required as part of the conditions of consent issued under the EP&A Act), and hence would not require formal notification under the CLM Act (1997), however this approach should be confirmed with NSW EPA to ensure strict adherence to the NSW DECC (2009) guidelines. It is noted that NSW EPA could potentially request some modifications to the existing groundwater and surface water monitoring program under the EPL.*

***Additional Baseline Data Recommendations***

*The data presented in this Phase 2 ESA was generally considered to be of a suitable quality and completeness to provide a baseline of environmental conditions at the Site and immediate surrounding receiving environments.*

*On the basis of the outcomes of this investigation, additional characterisation of the baseline conditions at the Site is not considered to be required. It is noted that groundwater impacts associated with Underground Petroleum Storage System (UPSS) infrastructure at the Site were identified independently of this assessment and the current site operator (EnergyAustralia) has been developing appropriate management approaches alongside independent consultants and regulators. On the basis of the outcomes of this Phase 2 ESA, it is considered that further monitoring may be required in these areas as follows:*

- Additional confirmatory groundwater sampling is recommended in AEC MJ (Operational USTs) to confirm the measured concentrations of benzene with specific reference to clarification of the duty to report contamination under Section 60 of the CLM Act (1997).*
- Additional groundwater monitoring and gauging in AEC ME (Mobile Plant Refuelling Area) to confirm the extent of Light Non-Aqueous Phase Liquid (LNAPL) prior to reporting to NSW EPA. This may have already been scheduled at the time of preparation of this report as part of the existing scheduled UPSS monitoring program and/or separate investigations initiated by Energy Australia. It is further recommended that the integrity of the oil pit and the adjacent oil-water interceptor in the Mobile Plant Refuelling Area is investigated.*



## 1 INTRODUCTION

### 1.1 BACKGROUND

Environmental Resources Management Australia Pty Ltd (ERM) was commissioned by Delta Electricity to undertake a Phase 2 Environmental Site Assessment (Phase 2 ESA) at Mt Piper Power Station. Mt Piper Power Station, herein referred to as “the Site”, is situated approximately 18 km north-north-west of Lithgow in the Central West region of New South Wales. The street address of the Site is 350 Boulder Road, Portland, NSW 2847.

The works detailed herein were completed to support the sale of the Site and in accordance with the work scope presented in the *Sampling Analysis and Quality Plan* [SAQP; ERM Reference 0207423RP01\_SAQP\_DRAFT] (ERM, 2013a), and *Preliminary Environmental Site Assessment* [PESA; ERM Reference 0194708RP03\_FINAL] (ERM, 2013b).

A site location plan is presented as Figure 1 of Annex A. The general Site layout is presented in Figure 2 and Figure 3 of Annex A.

### 1.2 OBJECTIVES

The primary objective for the Phase 2 ESA was to gather soil, sediment, surface water and groundwater data in order to develop a baseline assessment of environmental conditions at the Site and within surrounding receiving environments (including sediments samples from Lake Lyell and Thompsons Creek Reservoir), as at or near the time of the transaction. Data obtained during completion of the Phase 2 ESA may also be used to inform future management of contamination issues both at the Site and in relation to the relevant receiving environments.

### 1.3 MATERIALITY THRESHOLD

For the purposes of this report, a consistent approach regarding the materiality of a contamination issue has been adopted to that utilised in the PESA (ERM, 2013b) which was as follows:

- ERM adopted a materiality threshold of AUD 0.5 M (+ GST if applicable) per contamination source.
- Material costs are those costs for that item to meet relevant requirements of NSW EPA under its current land use to remediate or manage the contamination issue. Remediation or management includes additional assessment, environmental monitoring, management, containment or other remediation measures.

- In addition, any issue that ERM considers could have the potential to lead to prosecution by the regulatory authorities that could lead to significant business disruption or reputational impact will be considered material.

#### 1.4 APPROACH AND SCOPE OF WORK

The adopted approach and scope of works for the Phase 2 ESA works comprised the following general tasks, in accordance with the requirements set out in the *SAQP* (ERM, 2013a):

##### *Preliminaries*

- preparation of a site-specific Health and Safety Plan (HASP) and Environmental Management Plan (EMP);
- assessment of whether suitable monitoring wells exist at the Site, and whether they can be sampled as part of this investigation;
- identification of areas and constituents of potential concern additional to those identified during the *PESA* (ERM, 2013b);
- revision and amendment of the *SAQP* (ERM, 2013a), as necessary;
- engagement of subcontractors including underground utility locator, drillers, laboratories and surveyors;
- scheduling of Site works with Delta Electricity and Energy Australia; and
- completion of site-specific inductions and permitting, as required.

##### *Site Works*

- ground-truthing of proposed sampling locations including clearance of underground services as noted below;
- identification of above and below ground services in the vicinity of drilling locations by reviewing publically available Dial Before You Dig (DBYD) plans and site engineering drawings, and engaging a qualified underground service locator.
- intrusive drilling works and environmental sampling, including soil groundwater, sediment and surface water sampling, in accordance with the requirements of the *SAQP* (ERM, 2013a)

- laboratory analysis of selected soil and groundwater samples for particular constituents of potential concern (COPC) in accordance with the requirements of the SAQP (ERM, 2013a) and as outlined in *Section 4.9*; and
- the survey of newly installed and existing monitoring wells by a registered surveyor to Australian Height Datum (AHD) and Map Grid of Australia (MGA).

*Reporting*

- preparation and submission of weekly progress reports to Delta Electricity; and
- preparation and submission of this Phase 2 ESA report at the completion of works.

1.5

**REPORT STRUCTURE**

This Phase 2 ESA report has been prepared in general accordance with the NSW Environmental Protection Agency (EPA) *Guidelines for Consultants Reporting on Contaminated Sites* (EPA, 1997), as follows:

- *Section 1* - Introduction, background, objectives and scope of works;
- *Section 2* - Site setting including a summary of the Site history and Site conditions;
- *Section 3* - Data quality objectives (DQOs) for the works conducted;
- *Section 4* - Sampling and works methodologies for completing the investigation;
- *Section 5* - Results of the Phase 2 ESA works and Site-specific discussions and recommendations; and
- *Section 6* - Conclusions.

Other key guidelines utilised during completion of this Phase 2 ESA included, but were not limited to:

- Australian Standard (2005) AS 4482.1 *Guide to the Sampling and Investigation of Potentially Contaminated Soil. Part 1 – Non-volatile and Semi-volatile Compounds* (Australian Standard, 2005);
- Australian Standard (1999) AS 4482.2 *Guide to the Sampling and Investigation of Potentially Contaminated Soil. Part 2 – Volatile Substances* (Australian Standard, 1999);



- Australia and New Zealand Environmental and Conservation Council (ANZECC) and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) (2000) *Australia and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ, 2000); and
- National Environment Protection Council (NEPC) (April 2013) *National Environment Protection (Assessment of Site Contamination) Measure 1999*, NEPC, Canberra, (NEPC, 2013).

A full list of all references is also appended to this report.

## 1.6

### LIMITATIONS

The findings of this report are based on the client-approved SAQP (ERM, 2013a) and the scope of work summarised in *Section 1.3* of this report. ERM performed the services in a manner consistent with the normal level of care and expertise exercised by members of the environmental assessment profession. No warranties, express or implied, are made.

Although normal standards of professional practice have been applied, the absence of any identified hazardous or toxic materials on the subject Site should not be interpreted as a guarantee that such materials do not exist on the Site.

This assessment is based on Site inspections conducted by ERM personnel, sampling and analyses described in the report, and information provided by people with knowledge of Site conditions.

All conclusions and recommendations made in the report are the professional opinions of the ERM personnel involved with the project and, while normal checking of the accuracy of data has been conducted, ERM assumes no responsibility or liability for errors in data obtained from regulatory agencies or any other external sources (with the exception of accredited laboratories engaged by ERM to undertake analysis as part of these works), nor from occurrences outside the scope of this project.

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## 2

**SITE SETTING**

Mount Piper Power Station is a large coal-fired Power Station providing base load for the region via two 700 megawatt (MW) generating units. It is situated approximately 18 km north-north-west of Lithgow, in the Central West region of New South Wales (NSW). The Site is located north west of Sydney, between Lithgow and Portland, and is situated approximately 10 kilometres north-west of the Wallerawang Power Station (where a similar Phase 2 ESA has also been undertaken by ERM) as presented in *Figure 1 of Annex A*.

The Site was formerly owned and operated by Delta Electricity (a State Owned Corporation – SOC) however, along with Wallerawang Power Station, has recently been transferred to the ownership of Energy Australia (EA). The Site includes the main electricity generating area and associated coal stockpiles, ash emplacement areas, buffer zones (comprising dominantly native forested areas and open woodland and rehabilitated and revegetated land) and associated water assets as outlined in *Figure 3 of Annex A*.

## 2.1

**SITE IDENTIFICATION**

The approximate coordinates of the Power Station are 223759 m E and 6304970 m S. A Site location plan is provided as *Figure 1 of Annex A*. The total area of the Mount Piper site is approximately 820 hectares and includes:

- the main operational area of the Power Station, which comprises electricity generating activities and the associated coal stockpile;
- the ash emplacement area within a former mine void adjacent to the operational area;
- a buffer zone comprising native forested areas and open woodland and rehabilitated and revegetated land, and including a number of ancillary activities such as transmission line easements and former waste dumps; and
- the associated water assets, Lake Lyell located directly south, and Thompsons Creek Reservoir to the south-east. Water is supplied from off-site storage facilities which are outside the scope of this report.
- The entire area is shown in the Site Layout Plan provided *Figure 3.1 and Figure 3.2, Annex A*.

There are several parcels of land within the Mount Piper “fenceline” most of which are owned and operated by other electricity SOCs and Energy Australia, and these are outside the scope of this report.

The affected parcels consist of:

- a large area of land on the western side of the operational area that was previously transferred for potential future expansion of the Power Station (additional units). ERM's review of NSW government property mapping indicates that the parcel of land appears to consist of Lots 1, 2, 3 and 4 of DP1092737;
- a large triangular parcel of land to the south earmarked for the proposed rail coal unloader. ERM's review of NSW government property mapping indicates that the parcel of land appears to consist of Lots 1 and 2 of DP800003. This is agricultural land and is leased for agricultural use;
- the Power Station's switchyard which is owned and operated by the transmission SOC Transgrid. ERM's review of NSW government property mapping indicates that the parcel of land appears to consist of Lots 1, 2, 3 and 4 of DP1092737;
- a high voltage substation which is owned and operated by the transmission SOC Transgrid. ERM's review of NSW government property mapping indicates that the parcel of land appears to consist of Lot 22 of DP832446; and
- a section of forested land along Boulder Road that has been sold to the Lithgow District Car Club. ERM's review of NSW government property mapping indicates that the parcel of land appears to consist of Lot 1 of DP1127747.

For the purpose of this assessment, the Site has been divided into 13 individual areas of environmental concern (AECs), according to usage and the presence of potential sources of contamination. These areas, listed in *Table 2.1*, are discussed in detail in the *PESA* (ERM, 2013b).

**Table 2.1** *Summary of Areas of Environmental Concern*

Identification	AEC Description	Figure Reference	Approximate Area (Ha)
MA	Former Landfills	Figure 5.1	16.2
MB	Coal Storage Area	Figure 5.2	26.6
MC	Electrical Transformers	Figure 5.3	n/a (see MK)
MD	Workshops	Figure 5.3	0.2
ME	Mobile Plant Refuelling Area	Figure 5.3	1.3
MF	Operational ASTs	Figure 5.4 & 5.5	1.7
MG	Current Ash Repository	Figure 5.5	49.1
MH	Lamberts North Ash Repository	Figure 5.5	54.0
MI	Water Holding Ponds	Figure 5.3 & 5.5	18.5
MJ	Operational USTs	Figure 5.3	n/a (see MK)
MK	Accessible Operational Areas	Figure 5.3 & 5.4	21.9



Identification	AEC Description	Figure Reference	Approximate Area (Ha)
ML	Non Operational Areas	Figure 5.1, 5.2 & 5.4	627.9
MM	Water Assets	Figure 5.6	282.6

## 2.2

### *SITE HISTORY*

Construction of Mount Piper Power Station began in 1984, was halted in 1986 and began again in the early 1990s, with the station commissioned in 1993. Substantial earthworks were required to level the land and backfill a former open-cut mine which was historically operated on the Site.

Based on historical mining maps (CDM Smith, 2012; PPK Environment & Infrastructure Pty Ltd, 2000) open-cut mines were present beneath the current operational areas of the power station. These voids are understood to have been backfilled with overburden at the end of mining operations and are presented in *Figure 4, Annex A*. Site management advised during the completion of the Preliminary Environmental Site Assessment (PESA) that there have been no substantial changes to the building footprints and the current operational areas are representative of operations over the period from 1993 to 2013. There are three landfills which date from the early years of construction and operation of the station, as shown in *Figure 3.1, Annex A*.

Further information regarding the history of the Site, including historical aerial photographs, zoning and environmental approvals, licenses and management is presented in the *PESA* (ERM, 2013b).

## 2.3

### *SURROUNDING ENVIRONMENT*

The Site is surrounded by areas used mainly for mining purposes with some grazing, recreational and commercial forestry activities in the locality. Ben Bullen State Forest neighbours the site to the north and south-east.

Key industrial uses in the area are:

- Wallerawang Power Station located approximately 7 km to the south-east.
- existing and former coal mines surrounding the site (including Centennial Coal mine immediately east of the Site) and within the site footprint;
- the former Portland cement works are located 4 km to the west.

The closest residential areas to the Site include:

- rural residences that do not form part of residential centres. The closest identified residential property is located at 28 Jarrah Way, Portland. The identified property is located adjacent the buffer lands on the north-western site boundary, and approximately 2 km west of the Mt Piper operational area;
- Portland, approximately 4 km to the west. Two schools, one child care facility and a hospital are located within 5 km of the Power Station, all of these are situated within the town of Portland.
- Blackmans Flat approximately 3 km to the east.
- Cullen Bullen, approximately 6 km to the north.
- Lidsdale approximately 6 km to the south-east.
- Angus Place approximately 7 km to the north-east.
- Wallerawang, approximately 10 km to the south-east.

## 2.4

### TOPOGRAPHY

The Site lies at an elevation of between 925 and 960 m Australian Height Datum (AHD) within a valley created by ridges forming a U-shape to the east, south and west. The floor of the valley has been levelled to construct the Power Station. The U shaped ridges surrounding the site rise to elevations of about 1000 m approximately 1 km to the south, east and west of the centre of the Mount Piper Power Station, whilst to the north the surrounding hills peak around 1000 m approximately 3 km from the centre of the power station. Hilly forested country lies across the Castlereagh Highway to the north.

## 2.5

### GEOLOGY

#### *Regional Geology*

The Site is located on the western edge of the Sydney Basin which is characterised by easterly dipping sedimentary deposits. The *Western Coalfield Regional Geology (southern part) 1:100 000 Geological Map, 1<sup>st</sup> Edition* (Yoo, 1992) indicates that the site is underlain by the Permian age Illawarra Coal Measures comprising interbedded shale, sandstone, conglomerate and coal. This map further indicates the Narrabeen Group, comprising claystone, shale and sandstone, overlies the Illawarra Coal Measures and outcrops at high elevations across the Site within the buffer land.

North-south trending faults, and north-east to south-west lineaments are featured in the region. Two faults (position accurate) (Yoo, 1992) are reported to dissect the northern and southern site boundaries, passing through the former contractors yard and the operational area in the southern portion of the site and the coal storage area in the northern portion of the site.

Surrounding the site, the Narrabeen Group features in the Ben Bullen State Forest (which forms part of the Great Dividing Range) north east of the site. Permian age sandstone, shale and conglomerate of the Shoalhaven Group underlie the Illawarra Coal Measures and are located south and west of the site.

*Local Geology*

A description of the local geology based on environmental investigations conducted in the vicinity of the Site cited by CDM Smith (2012) is provided in Table 2.1.

**Table 2.2** *Description of Local Geology<sup>1</sup>*

<b>Stratigraphic Unit</b>	<b>Geological Formation</b>	<b>Description</b>	<b>Approximate Thickness (m)</b>	
Illawarra Coal Measures	Irondale Coal Seam	Coal, mainly bright, claystone, black carbonaceous and also buff	1.3-1.4 <sup>2</sup>	
	Long Swamp Formation	Silty sandstone Sandstone, siltstone and shale	1 - 1.5 12 - 14	
	Lidsdale Coal Seam	Coal, carbonaceous shale and sandstone	1.1 - 1.8	
	Blackmans Flat Conglomerate	Sandstone (medium to coarse grained) with interbedded siltstone	3 - 6	
	Lithgow Coal Seam	Coal, carbonaceous shale	1.9 - 2.3	
	Marrangaroo Conglomerate	Siltstone, mudstone and shale Sandstone with siltstone bands and some boulders	0.3 - 0.6 3.5 - 4.6	
	Shoalhaven Group	Berry Formation	Siltstone or silty sandstone, some pebbles.	>30

- 1 Table modified from (CDM Smith, 2012)
- 2 (Geoscience Australia)

Coal seams within the Illawarra Coal Measures have been widely mined in the region, and sections of the site are underlain by abandoned coal workings (both underground and backfilled open cut) from mining of the Lidsdale and Lithgow seams. The Lidsdale and Lithgow coal seams converge approximately one kilometre north-east of the Site. The Irondale Coal Seam has also been mined at higher elevations to the west in the Pipers Flat area.

The surface geology across the site has been extensively disturbed by mining activities. Voids created during open-cut mining were backfilled with overburden (CDM Smith, 2012), which likely included a mixture of coarse fragments (gravels, cobbles and boulders) of shale, siltstone, mudstone and sandstone. Geological features of the Site are presented in *Figure 4 of Annex A*.

Both the existing and the Lamberts North Ash Repository are located within former open cut mines. Both open cut mine workings extended to the base of the Lithgow Seam. Whilst approximately 1 m of fill material was placed at the base of the existing ash repository prior to ash deposition, 5 m of fill material was placed at the base of the Lamberts North ash repository prior to ash deposition (SKM, 2010).

Local geology specific to various areas of the Site, as encountered during the current drilling program, are discussed further in *Section 5.1* of this report.

## 2.6

### *HYDROGEOLOGY*

#### *Regional Hydrogeology*

Information on regional aquifer properties is limited as most investigations in the area have focussed on shallow aquifers (CDM Smith, 2012). No regional scale productive aquifer has however been identified in the vicinity of the Site. Large scale regional groundwater flow is expected to be towards the north/east, following the dip of the sedimentary deposits.

#### *Local Hydrogeology*

CDM Smith (2012) inferred that two aquifers are present beneath the site. Based on groundwater investigations associated with the Ash Repositories in the north-eastern portion of the site, a shallow aquifer is located at approximately 915 m AHD and flows in a north-easterly direction. Locally there may however be different directions in groundwater flow due to local variations in topography and surface water interactions. It is noted that between 2004 and 2012, groundwater levels of the shallow aquifer fluctuated up to 5 m with rainfall (CDM Smith, 2012). A deeper intermediate aquifer present at approximately 885 m AHD and within the Marrangaroo Conglomerate flows in a south-easterly direction. These aquifers are reportedly not connected.

Limited information is available regarding the north-south trending faults through the contractors yard, operational area, and coal storage area. Depending on the type, displacement, and whether infilling has occurred, the fault may connect the shallow and intermediate aquifers, or create a barrier between groundwater across the site.

Historic mining activities have had a significant impact on the groundwater regime underlying the site, impacting aquifer properties and groundwater flows. Where underground workings have been left in place, hydraulic conductivities as high as 5 to 50 m/d have been reported for the disturbed coal seams (Merrick, 2007), as cited in (CDM Smith, 2012).

A hydrogeological investigation (HLA Envirosiences, 2004) for the proposed Blackmans Flat Waste Management Facility (located directly down-gradient of the Site) reported an approximate hydraulic conductivity of  $10^{-1}$  m/d for the material used for backfilling of the open cut mine voids and approximately  $10^{-3}$  m/d for the Marrangaroo Conglomerate underlying the Lithgow seam. Groundwater seepage has been observed in remaining mine voids (such as the Huon Void/Pond, formerly known as the Groundwater Collection Basin).

Considering the above, the base of the open cut fill materials are considered to present the shallowest laterally extensive groundwater bearing unit at the site in locations of former open cut mining. Localised perched shallow groundwater has been noted in various groundwater monitoring wells installed for the purpose of assessing potential contamination from Underground Petroleum Storage Systems (UPSS). In areas where former underground mines remain in place, the disturbed coal seams are considered to present the shallowest laterally extensive groundwater bearing unit.

Details of hydrogeological conditions encountered during this Phase 2 ESA are summarised in *Section 5.1*.

## 2.7 GROUNDWATER USE

A search of publically listed boreholes on the *NSW Natural Resource Atlas* (NSW Government) 27 registered groundwater bores were identified within a 3 km radius of the site. These bores are registered for monitoring, industrial, irrigation, domestic and stock uses. Details of these industrial, domestic and stock bores are listed below in *Table 2.3*.

**Table 2.3 Registered Groundwater Bores in Proximity to the Site**

Bore ID	Distance from Power Station <sup>1</sup> (km)	Direction from site	Water Bearing Zone(s) (m)	Registered Use
GW053719	2.2km from Ash Repository	North East	-	Industrial
GW106737	2.5 km from Ash Repository	South East	84.0 – 84.5 5 (SWL – 33m)	Domestic
GW111942	2.9 km from Coal storage area	North	3-3.1 27-27.1 43-43.1	Industrial
GW802266	2.8 km from operational area	West	-	Domestic Stock

<sup>1</sup> Measured from the closest AEC

One groundwater bore is registered for domestic water supply purposes down-gradient of the site. This bore (GW106737) was installed across a shale water bearing zone at 84 m bgl and is considered to intersect the deeper aquifer. A second bore registered for industrial use (GW053719) appears to be installed within the Angus Colliery, owned by Centennial Coal. If groundwater flow in the area is dominated by local geology and flows in a north easterly direction, this bore may intersect the same water bearing unit which passes through the Mt Piper Power Station.

## 2.8

*HYDROLOGY*

The site is located within the Upper Cox's River Catchment. The main hydrological features in the area are shown on *Figure 1 of Annex A* and can be summarised as follows:

- Coxs River located approximately 2.5 km east from the site boundary. This is the main hydrological feature in the area. The Coxs River runs from north to south, and is dammed at Lake Wallace and Lake Lyell to provide water supply for the Delta Electricity Power Stations. The lakes are also used for other purposes including public recreation such as boating and fishing. The river ultimately flows to Lake Burragorang which stores much of Sydney's drinking water supply;
- Western Drain located within the site on the western boundary of the operational area. This diverts runoff from the hills above the site along the western boundary and into Neubecks Creek;
- Neubecks Creek (also known as Wangcol Creek) located immediately to the north of the site. Neubecks Creek drains from the area west and north of Mt Piper Power Station to join the Coxs River north of Lidsdale;
- Pipers Flat Creek located approximately 1.5 km south of the site boundary, running from west to east beyond the forested ridge behind the site; and
- Thompsons Creek Reservoir located approximately 8 km south-west from the site boundary of Mt Piper. This dam impounds Thompsons Creek to supply water to the Delta Electricity Power Stations. As the dam has a small catchment it is supplemented with water from Lake Lyell. It is used recreationally for trout-fishing. Thompsons Creek appears to run south to north joining Pipers Flat Creek (mentioned above).
- Hydrological features are presented in *Figure 1 of Annex A*.
- Surface water drainage has recently been diverted from the former Huons Gully located along the western edge of the area formerly mined by Centennial Coal in the recently purchased Lamberts North area. The drainage line formerly included a surface water pond known as Huons

Void, or the Groundwater Collection Pit which has now been filled and is understood to not directly discharge to Neubecks Creek.

### 2.8.1 *Lake Lyell*

The Coxs River was dammed downstream of Lake Wallace to form the Lake Lyell reservoir in 1982. Lake Lyell has an active capacity of approximately 31 GL, sourced from local runoff. The water is also pumped to off-stream storage at Thompsons Creek Reservoir, which supplies Mt Piper, or to Lake Wallace, which supplies Wallerawang Power Station.

At the time of preparation of the PESA three local farmers held agreements with Delta to agist stock within the buffer lands around Lake Lyell. It is further understood that these agreements were transferred to Energy Australia along with the sale of the Site. Lithgow City Council also owns a portion of lands adjacent to Lake Lyell, as well as leasing additional lands which are publicly accessible for camping and recreation areas.

### 2.8.2 *Thompsons Creek Reservoir*

Thompsons Creek Reservoir was constructed in 1992 on a small creek to provide off-stream storage for supply of the water to Mt Piper and Wallerawang. Although the surface runoff catchment of Thompson Creek is relatively small, Thompsons Creek Reservoir has a storage capacity of up to 27.5 GL with water routinely pumped from Lake Lyell.

The reservoir is also available to the public for recreational fishing, however other recreational activities (swimming / boating etc) are not permitted. Surrounding buffer lands are generally vacant vegetated lands, with some areas used for stock grazing by local farmers under agreements with Energy Australia.

## 2.9 *SENSITIVE RECEPTORS*

Sensitive receptors relevant to the Site identified as part of the SAQP (ERM, 2013a), included:

- indoor and outdoor human health receptors in the form of industrial workers;
- intrusive maintenance workers;
- residential receptors and potential groundwater users;
- recreational users of Lake Lyell (the closest surface water body where recreational access is currently approved);
- aquifers beneath the Site and nearby potable water wells; and



- ecological receptors, including freshwater ecological receptors in the local creeks, Lake Lyell, the Neubecks Creek and the Coxs River.

**2.10 POTENTIAL AND KNOWN SOURCES OF CONTAMINATION**

The following potential and known sources of contamination were identified as part of the PESA (ERM, 2013b):

- Former Mine and Backfilling of Operational Area (contamination of soil and groundwater from historical activities, or use or impacted fill material);
- Former Landfills (potential leaching from landfilled materials);
- Coal Storage Area (potential leaching from stockpiled coal);
- Electrical Transformers (potential leaks of transformer oil)
- Water Holding Ponds (potential leaks of ponds);
- Workshops (potential leaks of solvents);
- Mobile Plant Refuelling Area (potential fuel leaks);
- Operational USTs (potential fuel leaks);
- Operational ASTs (potential chemical and/or fuel leaks);
- Current Ash Repository (leachate);
- Lamberts North Ash Repository (leachate); and
- Lake Lyell and Thompsons Creek Reservoir (sediments may have accumulated contaminants from Mt Piper Power Station drainage and discharges).

Subsequent to the issue of the PESA (ERM, 2013b) the Site has self-notified groundwater contamination to NSW EPA under Section 60 of the CLM Act. The following details are listed on the NSW EPA register of contaminated sites:

**Table 2.4 Mount Piper Notification to NSW EPA under the CLM Act**

Suburb/ City	Site description and address	Activity that caused contamination	s60 form received?	EPA initial assessment	EPA site management class
Portland	Mt Piper Power Station 350 Boulder Road	Other Petroleum	Yes	In progress	B - The EPA is awaiting further information to progress its initial assessment of this site.

### 3 DATA QUALITY OBJECTIVES

Data quality objectives (DQOs) were developed to define the type and quality of data required to achieve the project objectives outlined in *Section 1.2* of this report. The DQOs have been prepared in line with the seven-step approach outlined in National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPC, 2013), and with reference to relevant guidelines published by the NSW EPA, ANZECC/ARMCANZ, and NEPC.

The DQO process is validated, in part, by the Quality Assurance and Quality Control (QA/QC) procedures and assessment, summarised in *Section 5.6* and presented as *Annex F* of this report.

The seven steps of the DQO process, and how they were applied to this assessment, are presented in the following sections.

#### 3.1 STEP ONE: STATE THE PROBLEM

A statement of the problem is provided by the particular objectives of the assessment as stated in *Section 1.2*. Background information is provided in *Sections 1* and *2* of this report, and via the conceptual site model (CSM) provided in *Annex C* which was developed as part of the SAQP (ERM, 2013a).

#### 3.2 STEP TWO: IDENTIFY THE DECISION

##### *Decision Statements*

The principal decision to be made is:

- Are there actual or potential material contamination issues relevant to the sale of the Mt Piper Power Station?

Additional decisions to be made include:

- Is there sufficient data to provide an environmental baseline at the time of the transaction?
- What is the nature and extent of soil, surface water and groundwater impact on or beneath the Site?
- What is the nature and extent of sediment and surface water and impact to Lake Lyell and Thompsons Creek Reservoir?
- Does the impact at the Site represent a risk to human health, based on the current and continued use of the site?

- Is the impact at the Site likely to warrant notification and / or regulation under the *NSW Contaminated Land Management Act, 1997*?
- Is material remediation likely to be required?

Adopted screening values and waste classification guidelines which will assist in making some of these decisions are identified below in *Section 3.5.2*.

### 3.3 *STEP THREE: IDENTIFY INPUTS TO DECISION*

The inputs required to make the above decisions are:

- existing relevant environmental data, taking into consideration the number and location of existing soil and groundwater sampling locations, the construction of existing groundwater monitoring wells and the date of the most recent sampling events;
- direct measurement of environmental variables including soil/sediment type, soil gas concentrations, odours, staining, water strike, groundwater level and water quality parameters;
- collection and laboratory analysis of soil, groundwater, sediment and surface water samples for identified COPCs;
- field and laboratory QA/QC data; and
- comparison of data against adopted screening values and waste classification guidelines (outlined in *Section 3.5.2*).

### 3.4 *STEP FOUR: DEFINE THE STUDY BOUNDARIES*

#### *Spatial Boundaries*

The site location and description is provided in *Section 2*. Figures identifying the site boundary and investigation areas are presented in *Annex A*. The physical spatial boundaries of the investigation included the surface and subsurface soils as well as groundwater beneath the site. Vertical boundaries of the investigation were limited to the depth of borehole advancement.

#### *Temporal Boundaries*

Temporally, the study is intended to provide a baseline assessment of the nature and extent of contamination at the Site, and in relevant receiving environments, as at or near the time of completion of the transaction to the extent practicable.

*Constraints within the Study Boundaries*

Constraints on the delivery of the objectives of the Phase 2 ESA program within the study boundaries may include:

- location of underground services or infrastructure; and
- the condition of existing monitoring wells.

## 3.5

**STEP FIVE: DEVELOP A DECISION RULE**

The DQOs were designed to facilitate the collection of adequate soil and groundwater data to address the decisions in Step 2 of the DQO process. During the course of the project, various constraints had varying impact on the implementation of the Phase 2 program. Examples of these constraints included restrictions of siting investigation locations due to physical access or to the presence of sub-surface services and or depth constraints due to the presence of shallow bedrock. Deviations from the Phase 2 program were tracked during the course of the investigation via the weekly progress spreadsheet and were communicated to the relevant project stakeholders. An extract of the weekly progress spreadsheet is provided below as *Table 3.1* which highlights locations proposed but abandoned during the course of the investigation.

The proposed Phase 2 program included soil samples from 183 locations and groundwater samples from 97 locations. The completed Phase 2 program included soil samples from 187 locations and groundwater samples from 77 locations. A detailed comparison of the proposed and completed investigation locations for each AEC along with explanations for changes is provided in *Table 8 of Annex B*.

Where access constraints were identified, boreholes and monitoring wells were moved (where possible to nearby locations) and where drilling was not feasible, surface soil samples were collected to assess direct contact pathways. In areas which could not be accessed for drilling, monitoring wells were located around the perimeter of the inaccessible area where possible. The distribution of monitoring wells around the perimeter provides an understanding of groundwater conditions up-gradient and down-gradient of the relevant AECs to assess the potential extent of contamination and identify potential for migration of contaminants. It is therefore considered that the number and distribution of completed boreholes and monitoring wells is sufficient for characterising soil and groundwater conditions for the purpose of this baseline assessment.

At the beginning of the Phase 2 program the conceptual site model (CSM) was revised in AECs MA (Former Landfills) and ML (non-operational areas) which resulted in changes to the SAQP in these AECs. The previous CSM for these AECs was based on a soil profile with capacity for shallow groundwater and potential contamination sources limited to surface activities such as maintenance and storage. Field observations indicated that the soil profile was shallow (<0.5 m bgl) or non-existent across most of the buffer lands on elevated terrain to the north and west of the main operational area. Initial drilling confirmed that groundwater was present at depths greater than 20 m bgl within rock strata. The density of monitoring wells was therefore reduced, as contamination, if present, would likely be present at the surface (<0.5 m bgl) and therefore is unlikely to migrate to groundwater at depths of greater than 20 m bgl. Access to areas within AECs MA (Former Landfills) and ML (non-operational areas) was also limited due to difficult access in terrain and dense vegetation, and the presence of overhead power lines restricting drilling locations. Irrespective of these constraints, it is considered that the number and distribution of completed boreholes and monitoring wells is sufficient for characterising soil and groundwater conditions for the purpose of this baseline assessment.

The main constraint on the implementation of the Phase 2 program within the main operational area (AEC MK and MI) was the presence of underground utilities and other operational hazards including traffic. It is considered that the number and distribution of completed boreholes and monitoring wells is sufficient for characterising soil and groundwater conditions for the purpose of this baseline assessment.

At the beginning of Phase 2 program the SAQP for the AECs MG (current ash repository) and MH (Lamberts North Ash Repository) were revised to account for the operational constraints at the time of sampling, however, it is considered that the number and distribution of completed boreholes and monitoring wells is sufficient for characterising soil and groundwater conditions for the purpose of this baseline assessment

**Table 3.1** *Mt Piper Phase 2 Investigation Location Abandonment*

AEC	Location	Location Type	Comments
MA	MA_MW02	Monitoring Well	Monitoring well abandoned due to change in conceptual site model. *
MA	MA_MW04	Monitoring Well	Monitoring well abandoned due to change in conceptual site model*.
MA	MA_MW06	Monitoring Well	Monitoring well abandoned due to change in conceptual site model*.

COMMERCIAL IN CONFIDENCE

AEC	Location	Location Type	Comments
MA	MA_MW09	Monitoring Well	Monitoring well abandoned due to change in conceptual site model* and physical access constraints.
MA	MA_MW10	Monitoring Well	Monitoring well abandoned due to change in conceptual site model* and physical access constraints.
MA	MA_MW11	Monitoring Well	Serviceable existing well located nearby considered adequate for the purpose of this investigation.
MG	MG_SB01	Soil Bore	Proposed location was outside the site boundary. No suitable alternate locations.
MH	MH_SB05	Soil Bore	Soil bore location abandoned due to physical access constraints
MH	MH_SB06	Soil Bore	Soil bore location abandoned due to physical access constraints
MH	MH_SB07	Soil Bore	Soil bore location abandoned due to physical access constraints
MI	MI_SB01	Soil Bore	Soil bore location abandoned due to physical access constraints. Nearby monitoring wells installed in the sewerage treatment plant.
MK	MK_SB21	Soil Bore	Soil bore location abandoned due to physical access constraints.
MK	MK_SB23	Soil Bore	Soil bore abandoned due to physical access constraints (underground services). Located adjacent to proposed monitoring well - MD_MW01 - providing sufficient data.
MK	MK_SB29	Soil Bore	Soil bore abandoned due to physical access constraints (underground services). Located adjacent to proposed monitoring well - MD_MW02 providing sufficient data.
MK	MK_SB41	Soil Bore	Soil bore location abandoned due to physical access constraints (known subsurface utilities). Located adjacent to existing well MJ_X_MWMP5.
MK	MK_SB45	Soil Bore	Monitoring well location abandoned due to physical access constraints (known subsurface utilities).
MK	MK_SB53	Soil Bore	Sufficient soil bores along fence boundary.

COMMERCIAL IN CONFIDENCE

AEC	Location	Location Type	Comments
MK	MK_SB60	Soil Bore	Soil bore location abandoned due to physical access constraints (known subsurface utilities and traffic). Located adjacent to proposed soil bore MK_SB61 which provides sufficient data.
MK	MK_SB63	Soil Bore	Soil bore location abandoned due to physical access constraints (known subsurface utilities).
MK	MK_SB64	Soil Bore	Soil bore location abandoned due to physical access constraints (known subsurface utilities).
MK	MK_SB66	Soil Bore	Soil bore location abandoned due to physical access constraints (known subsurface utilities).
MK	MK_SB67	Soil Bore	Soil bore location abandoned due to physical access constraints (known subsurface utilities).
MK	MK_SB69	Soil Bore	Soil bore location abandoned due to physical access constraints (known subsurface utilities).
MK	MK_SB70	Soil Bore	Soil bore location abandoned due to physical access constraints (known subsurface utilities).
MK	MK_SB72	Soil Bore	Soil bore location abandoned due to physical access constraints (known subsurface utilities).
MK	MK_SB73	Soil Bore	Soil bore location abandoned due to physical access constraints (known subsurface utilities).
MK	MK_SB74	Soil Bore	Soil bore location abandoned due to physical access constraints.
MK	MK_SB75	Soil Bore	Soil bore location abandoned due to physical access constraints (known subsurface utilities).
MK	MK_SB77	Soil Bore	Soil bore location abandoned due to physical access constraints.
MK	MK_SB80	Soil Bore	Soil bore location abandoned due to physical access constraints (heavy vehicle traffic).
MK	MK_SB83	Soil Bore	Soil bore location abandoned due to physical access constraints (known subsurface utilities).
MK	MK_SB85	Soil Bore	Soil bore location abandoned due to physical access constraints (heavy vehicle traffic).
ML	ML_MW01	Monitoring Well	Monitoring well abandoned due to change in conceptual site model*.

AEC	Location	Location Type	Comments
ML	ML_MW04	Monitoring Well	Monitoring well location abandoned due to physical access constraints (overhead transmission lines).
ML	ML_MW06	Monitoring Well	Monitoring well location abandoned due to physical access constraints.
ML	ML_MW09	Monitoring Well	Monitoring well abandoned due to change in conceptual site model*. Nearby locations MF_MW04 and MF_MW05 utilised.
ML	ML_MW11	Monitoring Well	Monitoring well location abandoned due to physical access constraints (overhead transmission lines).
ML	ML_MW13	Monitoring Well	Monitoring well abandoned due to change in conceptual site model*.
ML	ML_MW16	Monitoring Well	Monitoring well abandoned due to change in conceptual site model*. Sufficient investigation locations within the former Contractors Yard.

Notes:

\* See discussion in text above. The SAQP was revised in the field at the beginning of the Phase 2 program and it is considered that sufficient coverage was achieved.

### 3.5.1

#### *Field and Laboratory QA/QC*

The reliability of soil, sediment, surface water and groundwater data was assessed based on comparison with acceptable limits for field and laboratory QC samples outlined in relevant guidelines made or approved under the *NSW Contaminated Land Management Act 1997*, including the *ASC NEPM (NEPC, 2013)*. In the event that acceptable QC limits were not met, the field observations of the samples were reviewed and if no obvious source for the non-conformance was identified (such as an error in sampling, preservation of sample(s) or heterogeneity of sample(s), etc.) liaison with the laboratories was undertaken in an effort to identify the issue that had given rise to the non-conformance.

A summary of the QA/QC procedures and assessment is presented in *Section 5.9* and *Annex F* of this report.

### 3.5.2

#### *Screening Values*

Individual soil and groundwater data, along with the maximum, minimum, mean, standard deviation and 95% upper confidence limit (UCL) of the mean concentration (if required) were compared to adopted screening values.



Exceedence of adopted screening values does not necessarily indicate the requirement for remediation and/or a risk to human health or the environment. If individual or 95% UCL concentrations exceeded the adopted screening values, consideration of the extent of the impact, the potential for receptors to be exposed to the impact, and regulatory compliance was considered.

The adopted screening values have generally been sourced from guidelines made or approved under the *Contaminated Land Management Act 1997*, which includes the ASC NEPM (NEPC, 2013). Where alternative sources have been utilised, appropriate justification has been provided.

#### *Soil Screening Values*

Soil data was assessed against investigation criteria published in the following documents:

- NEPC (2013) *National Environment Protection (Assessment of Site Contamination) Measure 1999*, Schedule B1 - Guideline on Investigation Levels for Soil and Groundwater. Health Investigation Level (HIL) 'D' - Commercial/Industrial HIL 'C' - Public Open Space and Ecological Investigation / Screening Levels (EILs/ESLs) (as applicable). It is noted that laboratory analysis for pH and CEC is required to establish site specific EILs/ESLs, and an assessment of background conditions may be necessary. The establishment of EILs/ESLs was undertaken, and sample locations in up-gradient non-operational areas were utilised in establishing background conditions; and (NEPC, 2013);
- Application of the HILs will be considered on a case by case basis in accordance with the NEPM 2013 amendment to reflect local conditions encountered at the time of the intrusive works. Health Screening Levels for Vapour Intrusion and Direct Soil Contact (HSL) 'D' - Commercial/Industrial and Health Screening Levels for Vapour Intrusion and Direct Soil Contact Intrusive Maintenance Worker (Shallow Trench) will also be adopted; and
- Where applicable, the guidance provided in the Western Australia Department of Health (2009) *Guidelines for the assessment, remediation and management of asbestos-contaminated sites in Western Australia* has been adopted in relation to asbestos as referenced by the ASC NEPM (NEPC, 2013). This included consideration of the site-specific circumstances and the likely management and/or remediation approach (where required).

#### *Groundwater and Surface Water Screening Values*

Water data will be assessed against investigation criteria published in NEPC (NEPC, 2013) *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1)*, Schedule B1 - Guideline on Investigation Levels for Soil and Groundwater, which references the following guidance:

- ANZECC and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) (2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Trigger values for fresh water, level of protection 95% species and level of protection 99% species (for bioaccumulation of mercury and selenium); (ANZECC/ARMCANZ, 2000)
- National Health and Medical Research Council (NHMRC) and National Resource Management Ministerial Council (NRMMC) (2013) *Australian Drinking Water Guidelines Paper 6 National Water Quality Management Strategy*; (NHMRC, 2013)
- NHMRC (2008) *Guidelines for Managing Risks in Recreational Waters* (note that these will be applied with reference to NHMRC and NRMMC 2013 - referenced above); and (NHMRC, 2008)
- Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (CRC CARE) (2011) *Technical Report No. 10, Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater*. Health Screening Levels for Vapour Intrusion (HSL) 'D' - Commercial/Industrial and Health Screening Levels for Vapour Intrusion - Intrusive Maintenance Worker (Shallow Trench). (Friebel, 2011)

#### *Sediment Screening Values*

Sediment quality data will be assessed against screening values published in:

ANZECC / ARMCANZ (2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality - Interim Sediment Quality Guidelines (ISQGs)*, or the equivalent Commonwealth of Australia (DEWHA, 2009) *National Assessment Guidelines for Dredging*. (ANZECC/ARMCANZ, 2000)

### **3.5.3 *Appropriateness of Laboratory Limit of Reporting***

Comparison of the laboratory Limit of Reporting (LOR) to the screening values has been undertaken confirming that the screening values are less than the laboratory LOR with the exception of the following compounds:

- Some volatile organic compounds in water (including vinyl chloride, chloromethane, bromomethane, 1,2-Dichloroethane, hexachlorobutadiene, 1,2,3-trichlorobenzene and 1,2-dibromomethane) and pentachlorophenol have LORs marginally above the adopted ecological protection criteria and/or above the drinking water guidelines. With the exception of vinyl chloride, it is noted that these contaminants are not regarded as key contaminants of concern and no drinking water receptors have been identified within the vicinity of the Site. In the event that a detection of these compounds is noted, further investigation and/or explanation may be required. As vinyl chloride is a breakdown product of PCE and TCE, detections of these compounds may trigger the need for further consideration;

- PAHs in water, including Benzo(a) pyrene and Carcinogenic PAHs (as BaP TEQ), have LORs above the drinking water and recreational guidelines. The LORs are within the same order of magnitude as the recreational screening value and an order of magnitude above the drinking water guideline - noting that no drinking water receptors have been identified in the vicinity of the site. A detection of either of these compounds may require further investigation and / or explanation, and should take into consideration concentrations of other volatile TRH fractions.
- Selenium and mercury in water have LORs marginally above the adopted 99% freshwater ecosystem protection guideline. This guideline has been adopted as a precautionary approach and it is noted that the LOR is below the 95% guideline value. A detection of either of these compounds may require further investigation and/or explanation.
- Several PAHs in sediments have LORs marginally above the ISQG-Low, and on occasion, above the ISQG-High. However it is noted the LOR for total PAHs was below the ISQG-Low. The laboratory reported that standard LOR could not be achieved due to the moisture content of the samples.

### 3.6

#### *STEP SIX: SPECIFY LIMITS ON DECISION ERRORS*

The acceptable limits on decision errors applied during the review of the results will be based on the data quality indicators (DQIs) of precision, accuracy, representativeness, comparability and completeness (PARCC) in accordance with (NEPC, 2013) *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013, Schedule B3 - Guideline on Laboratory Analysis of Potentially Contaminated Soils*.

The potential for significant decision errors was minimised by:

- completing a robust QA/QC assessment of the validation data and application of the probability that 95% of data will satisfy the DQIs, therefore a limit on the decision error would be 5% that a conclusive statement may be incorrect;
- assessing whether appropriate sampling and analytical density has been achieved for the purposes of providing a baseline of soil, sediment and groundwater conditions at the point of transaction; and
- ensuring that the criteria set was appropriate for the ongoing use of the site as a power generation facility.

3.7

*STEP SEVEN: DEVELOP (OPTIMISE) THE PLAN FOR COMPLETING THE WORKS*

The DQOs have been developed based on a review of existing data and discussions with Delta Electricity. If data gathered during the assessment indicated that the objectives of the assessment programme were not being met, the sampling design (including sampling pattern, type of samples and analytes) was adjusted accordingly using feedback (where necessary) from project stakeholders.

## 4 SAMPLING METHODOLOGY

### 4.1 RATIONALE

Based on a review of the available data and the establishment of potential AECs, the most appropriate sampling design to achieve the stated project objectives was considered to be primarily based on a judgemental (targeted) sampling program, which in itself provides good coverage of operational areas or areas, and minimal additional sampling undertaken to provide spatial coverage for low risk areas of the site (eg buffer lands) or to fill material data gaps within the CSM. It is noted that intrusive investigations were limited to areas where access and site activities enabled investigations to occur without unacceptable health and safety risks to personnel and/or unacceptable disruption to site operations. The sampling plan was discussed with site management prior to the commencement of works to assess this risk and was subject to minor alteration (refer to *Table 3.1*).

Given the scale of the site, different sampling densities were adopted based on estimated contamination risk and logistical constraints of different areas of the site. The sampling approach was generally in accordance with the NSW EPA *Sampling Design Guidelines* (NSW EPA, 1995) which does not recommend a minimum number of sampling points for sites larger than 5.0 ha. The NSW EPA *Sampling Design Guidelines* (NSW EPA, 1995) recommends four sampling patterns; judgemental, random, systematic and stratified. As recommended in these guidelines, a stratified sampling pattern was adopted whereby the Site was divided into smaller areas of environmental concern (AECs) based on a review of historical activities and identified potentially contaminating activities.

A combination of systematic and judgemental sampling patterns was therefore adopted within each AEC to both target specific potential point sources (e.g. fuel storage tanks) and to provide sufficient lateral coverage. The exception to this was sampling within the operational area, for which a grid-based systematic approach was adopted. The sampling densities adopted are considered appropriate for the purpose of this assessment.

The sampling pattern and density was limited by the constraints on drilling (as discussed in *Section 3.3*), however a systematic approach was achieved with monitoring wells were located down-gradient of inaccessible areas where feasible. Whilst there remains potential for localised areas of contamination to exist, the network of monitoring wells is considered to be sufficient to establish the presence of potentially material contamination by delineating the maximum extent of potential impacts.

It is therefore considered that the number and distribution of completed boreholes and monitoring wells is sufficient for characterising soil and groundwater conditions for the purpose of this baseline assessment within the constraints previously discussed and identified within the SAQP (e.g. subsurface utilities).

Final investigation locations are presented in Figures 5.1 to 5.7 of Annex A.

## 4.2 *SITE INSPECTION*

The work areas of the Site were inspected and the soil and groundwater sampling locations were marked out to target identified Site features and potential contamination sources. At the same time as clarifying the investigation locations, sub-surface utilities were marked out using an appropriately qualified service locator. Ground penetrating radar (GPR) and cable avoidance tool (CAT), along with DBYD plans and Site engineering drawings were utilised to identify underground services and utilities.

## 4.3 *SOIL INVESTIGATION*

### 4.3.1 *Soil Sampling Procedure*

Soil investigation and sampling works were undertaken in general accordance with ERM's Standard Operating Procedures (SOPs). The location and number of sampling locations are presented within *Figures 5.1 to 5.8 of Annex A* and listed by AEC (Area MA - Area MM) in *Table 1 of Annex B*. Where practicable, all boreholes were advanced to an initial depth of 1.5 m bgl using either hand augering or Non-Destructive Digging (NDD) techniques in accordance with ERM's sub-surface clearance procedures. Drilling and soil sampling of subsurface material beyond 1.5 m bgl, were undertaken using a Geoprobe® drilling rig with a continuous push tube sampler where conditions allowed. Other methods of borehole advancement included solid stem mechanical augering, and air rotary methods, where bedrock was encountered or subsurface material could not be penetrated using push tube methods.

Regardless of the drilling methodology adopted, soil sampling techniques which minimised the potential for loss of volatiles were utilised. Where the collection of undisturbed samples was not possible (eg during hand augering) the potential for loss of volatiles was minimised by sampling from larger clods and minimising the duration between sample excavation and placement into the sample container.

Field screening was conducted in accordance with ERM's SOPs using a photo-ionisation detector (PID) fitted with a 10.6 eV lamp, calibrated at the beginning of each working day. Calibration certificates are presented in *Annex E*. Where practicable, soil was collected at 0.5 m depth intervals (or where significant changes in lithology were identified) to 2 m bgl and at 1 m depth intervals thereafter. Soil samples were placed in a zip lock bag, sealed and screened for the presence of ionisable volatile compounds. Where the presence of volatiles or other impact was suspected, additional samples were collected.

Soil properties were logged by an appropriately trained and experienced field scientist in general accordance with *Australian Standard AS 1726-1993, Geotechnical Site Investigations* (Standards Association of Australia, 1993). Representative soil samples were collected for laboratory analysis at selected locations, based on visual and/or olfactory evidence of the following:

- multiple layers of fill material;
- changes in the soil profile; and
- potential impact.

Soil samples were collected, to the extent practicable, in accordance with techniques described in *Australian Standard AS4482-2005* (Parts 1 and 2) to maintain the representativeness and integrity of the samples. Soil samples for laboratory analysis were collected from either the hand auger or directly from the push tube core. No samples were collected for laboratory analysis from solid flight augers, unless otherwise stated within borehole logs presented in *Annex D*. The frequency and nature of field QA/QC samples collected during the assessment works are summarised in *Annex F*.

Soil samples were generally labelled using the nomenclature presented in *Table 4.1*(below).

**Table 4.1** *Sample Naming Protocol*

<b>Sample</b>	<b>Identification</b>
Sample taken from shallow hand auger soil bore or deeper soil bore, SB01 at depth of 0.5 m bgl, within work area MA	MA_SB01_0.5
Sample taken from depth of 5 m bgl from a soil bore to be installed as Monitoring Well MW07, within work area MA	MA_MW07_5.0
Sediment samples taken from SS01 within work area MM at a depth of 0.25 m below the surface of the sediment.	MM_SS01_0.25
Surface water samples taken from SS01 within work area MG	MG_SS01

Sample jars were sealed and immediately placed in an insulated cooler, on ice, and stored to minimise potential loss or degradation of volatile compounds. Samples were shipped under chain of custody documentation to the analytical laboratory. Trip blanks and field blanks were used to assess if cross contamination occurred during the sample collection process.

Soil samples were collected for asbestos analysis in general accordance with the requirements of the *ASC NEPM* (NEPC, 2013) incorporating the WA DOH guidelines (*WA DOH, 2009*) and the *ERM Assessment of Asbestos Impacted Areas SOP* (ERM, 2012). No potential asbestos containing material (ACM) was identified at the surface or during the investigation works, and there were no ACM fragments submitted for analysis. Discrete 500 ml samples of soil were collected in snap lock bags during NDD for laboratory analysis for asbestos fibres. These samples were submitted to the laboratory for asbestos identification and (where identified) quantification (%w/w analysis) in accordance with the *ASC NEPM* (NEPC, 2013) and the WA DOH guidelines (*WA DOH, 2009*).

#### **4.3.2**      *Decontamination Procedure*

Down-hole drilling and non-single use sampling equipment was decontaminated by initially removing any residual soil with a stiff brush and then washing the equipment in a 2% Decon 90 solution and rinsing with potable water.

#### **4.3.3**      *Soil Bore Reinstatement*

Upon completion, soil bores were backfilled and the surface covering reinstated to match existing.

#### **4.3.4**      *Management of Waste Materials Generated During Drilling*

All non-liquid waste materials generated during drilling works were stored on-site in stockpiles inside a temporary bund in a designated area near the ash repository. If evidence of significant contamination was observed during drilling (e.g. staining or odour) potentially impacted wastes could be stored separately.

The soil will be beneficially re-used as capping material within the ash repository, in accordance with environmental licence conditions. The ash repository is currently managed by LendLease on behalf of Energy Australia.

Potentially contaminated PPE used during drilling including Tyvek suits and disposable P2 face masks were placed inside two 200 micrometre (µm) thick, asbestos labelled bags (i.e. double bagged) and then into labelled drums. The drums were collected by an appropriately licenced waste contractor (Environmental Treatment Services Pty Ltd - ETS) and transported to an appropriately licenced waste facility in accordance with NSW waste regulations. Relevant disposal documentation can be provided upon request.



#### 4.4 GROUNDWATER INVESTIGATION

##### 4.4.1 Monitoring Well Construction

Selected boreholes were converted to groundwater monitoring wells in accordance with ERMs SOPs. The groundwater monitoring well locations are presented in *Figures 5.1 to 5.7 of Annex A*. The following methodology was implemented to install new monitoring wells:

- wells were constructed of heavy duty 50 mm diameter class 18 uPVC with factory slotted screen (0.4 mm slots) and plain well casing. Where practicable, the wells were screened within groundwater bearing strata in accordance with ERMs SOPs with consideration of potential regional and seasonal fluctuations of the water table and constructed to allow the potential ingress of non-aqueous phase liquids (NAPL);
- following drilling, the well casing and screen were inserted into the drill casing. Washed and graded filter sand was poured into the annulus between the well screen and casing wall, ensuring that the sand covered the entire screened level and extended approximately 0.5 m above the top of the well screen;
- bentonite granules were then poured on top of the sand to an approximate thickness of 1 m and hydrated to effectively seal off the well from surface water or perched/shallow groundwater inflows; and
- the remaining annulus from the top of the seal to the base of the concrete was grouted with cement/bentonite grout to within 0.25 m of the surface and the final 0.25 m reinstated with concrete and a heavy duty well cover (flush gatic cover or raised monument as appropriate). The well casings were sealed with air-tight, lockable 'Envirocaps'.

Following monitoring well installation, each well was developed using a submersible 12V electric 'Typhoon' pump to remove any fine or granular materials or contaminants potentially introduced during drilling and to optimise hydraulic connectivity with the surrounding aquifer. Wells were considered developed when either a minimum of 10 well volumes had been removed, when water quality parameters had stabilised or if the well was developed dry prior to this.

Monitoring well construction details are presented within the borehole logs in *Annex D*.

#### 4.4.2 *Groundwater Purging and Sampling Protocol*

Groundwater purging and the sampling of newly installed monitoring wells generally occurred at least one week following monitoring well installation and development, to allow subsurface conditions to stabilise. Both new and existing monitoring wells were purged and sampled as outlined below.

The presence of odours was noted, where applicable, following removal of the well cap and prior to purging. Any odours were described by reference to their intensity and character.

Following a period of no pumping (as a minimum 24 hours), wells were dipped to gauge the depth to groundwater, and the potential presence and depths of NAPLs.

Monitoring wells were purged using either a thoroughly decontaminated peristaltic or micro purge pump under low flow conditions, where hydrogeological conditions allowed, until sufficient water has been removed to obtain stabilised readings of pH, conductivity, redox potential, temperature and dissolved oxygen which was calibrated prior to use. The stabilisation criteria are as described below.

**Table 4.2** *Water quality parameter stabilisation criteria*

<b>Parameter</b>	<b>Stabilisation criteria</b>
pH	± 0.1 pH units
Electric Conductivity (EC)	± 3% (µS/cm or mS/cm)
Temperature	± 0.5°C
Oxidation Reduction Potential (ORP)	± 10 mV
Dissolved Oxygen (DO)	± 0.3 mg/L

It is noted that both ORP and DO are typically slower to stabilise than the other parameters. Where ORP and DO did not stabilise, therefore, greater weight was given to pH and EC as the stabilising parameters.

Low-flow sampling techniques were used to obtain samples that were representative of the local groundwater environment at the Site. The inlet of the low-flow purge pump was placed approximately 50 cm from the base of the well in order to obtain a representative sample. Water samples were collected using equipment dedicated to each monitoring well to reduce the potential for cross-contamination between sampling locations.

The following order of sampling was adopted:

- samples to be analysed for volatile compounds placed into 40 mL amber vials;

- samples to be analysed for semi-volatile compounds placed into one 100 mL solvent washed amber bottles and one, 1 litre solvent washed amber bottle (for inter-laboratory duplicate samples);
- samples to be analysed for dissolved metals filtered through disposable 0.45 µm filters and placed in 60 mL plastic bottles preserved with nitric acid, or 60 mL unpreserved plastic bottles for ultra-trace metals;
- samples to be analysed for ferrous iron filtered through disposable 0.45 µm filters and placed in 60 mL plastic bottles preserved with hydrochloric acid; and
- samples to be analysed for major cations and anions placed in an unpreserved 250 mL plastic bottle.

Light Non-Aqueous Phase Liquid (LNAPL) was observed at three locations in area ME during the groundwater monitoring and sampling event. Where LNAPL was detected with an interface probe, a clear plastic bailer was used to confirm the presence, thickness and appearance of the LNAPL. No samples were collected or analysed from groundwater monitoring wells where LNAPL was detected.

The containers were filled, where practical, to minimise headspace, before being sealed and appropriately labelled. Labels included the following information:

- sample identification number;
- sampler;
- job number; and
- date of collection.

Samples were sealed and immediately placed in a cooler on ice to minimise potential for degradation of the sample. All samples were shipped under chain of custody documentation to the analytical laboratories.

#### **4.4.3 Waste Material Generated During Groundwater Development/Purging**

With approval from Delta Electricity and Energy Australia, waste water from development and purging of groundwater monitoring wells was disposed of via designated drains on-site which discharged to treatment systems.

#### 4.5 SURVEYING

All soil bore investigation locations were digitally located by field staff with a handheld Global Positioning System (GPS) unit. Additionally, all groundwater monitoring wells were surveyed by a registered surveyor (Craven Elliston & Hayes) to AHD for elevation and MGA coordinates for location. Survey data is presented in *Annex J*. The elevation of the highest point of the top of the uPVC well casing was surveyed to facilitate appropriate groundwater elevation calculations and groundwater flow direction interpretations.

#### 4.6 SEDIMENT INVESTIGATION

Sediment samples were collected from 7 sampling locations (as shown on *Figure 5.7, Annex A*).

Sediment samples were collected in general accordance with the methodologies outlined in *CSIRO Handbook for Sediment Quality Assessment* (2005). Sediment was collected from each sampling location with a stainless steel Van Veen grab sampler. The grab sample was inspected and if it was deemed to be of acceptable quality i.e. Van Veen fully closed, the sediment-water interface undisturbed with no evidence of loss of fines, and sufficient sample volume, the sediment was transferred to a container and homogenised.

If there was insufficient sample volume in a single grab sample, but the sample was otherwise of acceptable quality, sediment from multiple grabs was included in the sample.

Sample handling and labelling procedures were consistent with those adopted for soil sampling and those outlined in *Handbook for Sediment Quality Assessment* (CSIRO, 2005). The sediment volume, colour, grain size, odour, and presence of debris, organic matter, or biota were noted. Sediment samples were transferred to laboratory supplied glass jars for chemical analysis and 500 mL 'snaplock' bags for grain size analysis. Care was taken to minimise head space in the sample jars to reduce the potential for loss of volatile COPCs. The samples were stored on ice and transported under chain of custody to the analytical laboratory. The Van Veen and all other equipment used in the process of collecting the sediment samples were decontaminated (using the same procedures as those previously outlined for soil sampling equipment) between sampling locations.

#### 4.7 SURFACE WATER INVESTIGATION

Surface water sample locations were co-located with sediment sample locations. Surface water samples were collected prior to the collection of sediment samples, to avoid increased turbidity which may occur following sediment sampling.

Surface water samples were collected from Lake Lyell and Thompsons Creek Reservoir. Surface water samples were collected approximately 1.0 m above the sediment using a 1 litre Van Dorn sampler. The water was transferred directly from the Van Dorn sampler to analyte-specific laboratory supplied containers.

Sample containers were sealed and immediately placed in a cooler on ice to reduce potential for degradation of COPCs. The samples were then transported under chain of custody conditions to the analytical laboratory, and analysed for relevant COPCs.

A calibrated water quality meter was used to measure field parameters including pH, conductivity, redox potential, temperature, total dissolved solids (TDS), and dissolved oxygen. Observations of the general condition of the surface water and its surrounds were recorded during sampling.

#### 4.8 LABORATORY ANALYSIS

The laboratories used for the investigations were accredited by the National Association of Testing Authorities (NATA), Australia. The primary laboratory used for soil and groundwater analysis was ALS Environmental Pty Ltd (ALS). Inter-laboratory duplicate samples were analysed by a secondary laboratory, Envirolab Services Pty Ltd (Envirolab). The analytical methods used by each laboratory are provided in the laboratory certificates in *Annex H*.

Soil, sediment, groundwater and surface water samples were analysed for the following COPCs:

- metals and metalloids (arsenic, cadmium, chromium, copper, nickel, lead, mercury, selenium and zinc);
- total recoverable hydrocarbons (TRH);
- polycyclic aromatic hydrocarbons (PAHs); and
- benzene, toluene, ethylbenzene and xylenes (BTEX);

Additional contaminants of concern were analysed on a sub-section of the soil and groundwater samples collected. These contaminants included:

- asbestos (presence / absence – soil only);
- polychlorinated biphenyls (PCBs) – related to use of PCB-containing transformer oils on site; and
- volatile organic compounds (VOCs in addition to BTEX).

Selected soil samples were also analysed for the following to allow for adoption of appropriate screening values:

- total organic carbon (TOC);
- particle size distribution (PSD);
- electrical conductivity (EC); and
- pH and cation exchange capacity (CEC).

#### 4.9 *QUALITY ASSURANCE/QUALITY CONTROL*

A detailed QA/QC report including field procedures, laboratory methods and an analysis of QA/QC results from the investigation is provided in *Annex F*. QA/QC information incorporating inter-laboratory and intra-laboratory duplicates, rinsate samples and trip spike/blank samples is also presented in *Tables F6 to F13 of Annex F*.

In summary, the QA/QC data reported by ALS for soil and groundwater samples and field duplicate results were generally free of systematic and method biases and were assessed to be of sufficient quality for the purposes of this investigation.

There were some instances where the adopted screening values were less than the laboratory LOR. These potential non-conformances are discussed in *Section 5.6* of this report.

5 **RESULTS AND DISCUSSION**

5.1 **SITE GEOLOGY OBSERVATIONS**

A generalised description of the lithology and geology encountered at the Site is presented in *Table 5.1*. Detailed descriptions of the Site lithology and geology as observed during the investigation are presented on the borehole logs in *Annex D*.

Backfilled former open-cut mine voids were present across the current operational areas of the Site. These appeared to have been backfilled with overburden at the end of mining operations. Within these disturbed portions of the Site, subsurface soil conditions encountered largely comprised fill materials in the form of reworked local soils and rock overlying natural bedrock. An example of mine overburden fill materials is shown in *Photograph 20, Annex G*. Within undisturbed areas, fill typically overlaid shallow natural bedrock generally within 1.5 m of the surface. The depth to bedrock varied across the Site corresponding with topography, with outcropping siltstone and sandstone observed in elevated areas to the west of the operational area. An outcrop of coal is shown in *Photograph 14, Annex G* and an outcrop of siltstone is shown in *Photograph 15, Annex G*.

**Table 5.1 Generalised Field Lithology Descriptions**

<b>Lithological Unit</b>	<b>Description</b>	<b>Depth<sup>1</sup> (m bgl)</b>
<i>Hardstanding</i>	Concrete generally in good condition. (present in locations within the operational area)	0 - 0.2
<i>Fill - Mine Overburden</i>	Sandy clay or gravelly clay with angular gravels, cobbles and boulders, brown or brown with orange, red and grey mottling, dry to moist, non-plastic, no odours or staining.	0.2 - up to 15 <sup>2</sup>
<i>Natural Soil<sup>3</sup></i>		
Clay	Dark brown, becoming pale grey with orange mottling with depth, moist to wet, homogenous, high plasticity, organic matter (fibrous roots).	2.5 - bedrock
Clay	Yellow brown, becoming pale grey with depth, moist, homogenous, high plasticity, organic matter	2.5 - bedrock
Sandy Clay	Brown, wet, low plasticity	4.1- 5.0 (AEC MA)
Silt	Grey brown, slightly moist, homogenous, low plasticity, no staining, no odour, organic matter.	4.5-5. (AEC MB)

Lithological Unit	Description	Depth <sup>1</sup> (m bgl)
<i>Bedrock</i>	Interbedded siltstone, sandstone, shale and coal. Siltstone: pale to dark grey, generally dry  Sandstone: pale grey to brown, medium to coarse grained, dry, at times - moist to wet;  Shale: dark grey, very fine grained, generally dry;  Coal: black, dry or wet.	1.5 – 30.0
<ol style="list-style-type: none"> <li>1. Given the variation in topography and mining activities across the Site, depths and lithologies may vary across the site.</li> <li>2. Depth of fill across the site varied significantly. Fill material was recorded up to 15 m bgl within former open cut mining areas and extending to 1.5 m within areas undisturbed by mining activities (generally the western portion of the main operational area (AEC MK) )</li> <li>3. Natural soils typically recorded in the buffer lands and around the former landfill area (AEC MA), coal storage area (AEC MB), and some portions of operational area (AEC MK)</li> </ol>		

## 5.2 GROUNDWATER FIELD OBSERVATIONS

Newly installed monitoring wells were generally gauged and sampled at least 72 hours after well installation and development to allow subsurface conditions to stabilise. Groundwater gauging and sampling was completed for newly installed and existing monitoring wells between 3 October and 19 December 2013. During this time, a total of 90 mm of rain was recorded. Rain was largely recorded (31.6 mm) between 11 and 23 November, 2013.

Groundwater gauging data is presented in *Table 2 of Annex B*. Groundwater was encountered at depths ranging from 0.60 m bgl to 29.01 m bgl, or 904 m AHD to 970 m AHD.

Field records for groundwater well development and sampling area presented *Annex E*. Groundwater field parameters recorded during purging of wells prior to sampling are presented in *Table 3 of Annex B*.

## 5.3 SEDIMENT AND SURFACE WATER SAMPLES

A total of 7 sediment and surface water samples were collected to assess the baseline condition of Lake Lyell and Thompsons Creek Reservoir. One additional surface water sample was collected from the freshwater pond in AEC MH. Sampling locations were distributed around the AEC as presented in *Figures 5.7 of Annex A*. Further details of these works are presented in *Section 0* and *Section 5.4.8*.



## 5.4 AREAS OF ENVIRONMENTAL CONCERN (AEC) SUMMARY

### 5.4.1 MA -Former Landfills

#### *Background*

There are three closed landfills present on the Site, as shown in *Figure 5.1, Annex A*, which date from the early years of construction and operation of Mt Piper Power Station.

Whilst each landfill was intended for a specific purpose and such practices were not uncommon at that time, the disposal of waste was largely uncontrolled and a range of potential contaminants may therefore be present. The former construction waste landfill was used by contractors for disposal of building waste and materials from the construction of Mt Piper Power Station. The landfill is located in a gully in the western buffer land. Potential contamination concerns include impact from non-inert construction wastes (oils, solvents, paints). The former general waste landfill included putrescible waste and site management indicated that it was not used for disposal of restricted wastes (ash or related wastes). The landfill consisted of an unlined trench without controls on landfill gas or leachate. The landfill was reportedly used between 1993 and 1995, when the Power Station changed its policy and disposed of waste off-site. A relatively small proportion of the planned landfill was therefore filled. The landfill is located to the south-west of the main operational area in the western buffer land. Potential contamination concerns include impact from putrescible wastes (leachate). The 'chitter dam' landfill is located upgradient from the former putrescible waste dump and was constructed originally as a surface water dam but was never used for storage of water supplies. The dam was converted for use as a landfill for chitter, which is a coarse reject material from coal washing (PPK Environment & Infrastructure Pty Ltd, 2000) 'Hard' construction waste such as concrete was also disposed in this landfill (PPK Environment & Infrastructure Pty Ltd, 2000). Potential contamination concerns include impact from chitter (that is, coarse carbonaceous wastes) such as acidity, dissolved salts and heavy metals.

Given the absence of previous environmental characterisation work, further investigation was considered to be required to provide a baseline assessment of soil and groundwater conditions in this area.

#### *AEC Methodology and Investigation Field Observations*

A total of six soil investigation bores, three of which were completed as groundwater monitoring wells, were advanced within this AEC. One monitoring well was installed down- or cross- hydraulic gradient of each of the chitter dam, general and construction waste landfills. Three existing monitoring wells were also gauged and sampled as part of the ESA. The sampling locations within this AEC are presented on *Figure 5.1 of Annex A*. Relevant borehole logs are presented within *Annex D*.

No field indicators of contamination, such as staining, odours or visibly stressed vegetation were noted within this AEC. No staining or unusual odours were detected at any depth through the sampled soil profile. Measured concentrations of ionisable volatile compounds via headspace analysis were noted not to exceed 1.8 ppm v (isobutylene equivalent) in any soil sample collected from this AEC.

A summary of the field observations from the drilling works are presented within *Table 5.2*.

**Table 5.2** *Field Observations Summary - AEC MA*

Borehole ID	Depth (m bgl)	Visual or Olfactory Evidence	PID Range (ppm v - isobutylene equivalents)
MA_MW01	4.3	None	0- 0.1
MA_MW03	3	None	0-0.1
MA_MW05	0.3	None	n/a <sup>^</sup>
MA_MW07	8.2	None	0.0
MA_MW08	0.8	None	n/a <sup>^</sup>
MA_MW12	5	None	0.0-1.8

<sup>^</sup> refusal encountered on sandstone. Insufficient sample for duplicate to measure with PID due to coarse fill material (gravel).

Groundwater parameter readings collected during the groundwater sampling works are presented in *Table 3 of Annex B*. Field parameters were generally within the expected range in this AEC. Electrical conductivity (EC) readings indicated fresh water conditions. EC readings in the southern part of the Site, both up-gradient of the chitter dam (2.6 µS/cm at MA\_MW01) and down-gradient of the former general waste landfill (0.2 µS/cm at MA\_MW07 and ML\_MW12) were an order of magnitude lower than the typical EC readings across the Site (median EC 665 µS/cm).

No indications of contamination such as sheens or odours were observed during groundwater sampling within this AEC. As summary of field observations from the groundwater sampling works are presented within *Table 3 of Annex B*.

*Soil Analytical Results*

The soil analytical results have been compared to the adopted human health and ecological screening values as presented in *Table 4a of Annex B*

Measured concentrations of COPCs were below the adopted screening values in all soil samples collected from within this AEC. The majority of measured concentrations were below or close to the corresponding laboratory LOR with the exception of various heavy metals, however all of these concentrations were below the adopted screening values.

*Groundwater Analytical Results*

Groundwater analytical results compared to the adopted screening values are presented in *Table 5a of Annex B*. In addition to monitoring wells located within the designated AEC, monitoring well ML\_MW10 is located upgradient of the former construction landfill and has been considered as part of this assessment. Exceedences of the adopted screening values are also graphically presented in *Figure 8.1 to 8.9 of Annex A*.

Measured concentrations of the majority of the COPCs were below the laboratory LOR in all groundwater samples analysed. The exceptions to this were some detections of metals within groundwater across this AEC.

Copper, manganese, nickel and zinc were detected at concentrations in excess of the adopted ecological screening values in groundwater samples collected from monitoring wells within this AEC. At ML\_MW10 the measured concentration of lead also exceeded the adopted ecological screening values.

Manganese and nickel were detected in groundwater at concentrations in excess of the human health (drinking water) screening values in groundwater samples collected from monitoring wells within this AEC. Manganese was detected in groundwater in excess of the human health (recreational assessment) criteria in three groundwater monitoring wells.

*Discussion*

No exceedences of the adopted ecological or human health screening values were identified in soil samples collected from within this AEC.

All groundwater monitoring wells in this AEC, including upgradient well ML\_MW10, reported metals concentrations greater than the adopted ecological screening values. Metals exceeding the adopted ecological screening values included copper, lead, manganese, nickel and zinc. Manganese and nickel concentrations in excess of the adopted human health (drinking water and/or recreational) screening values were also reported in a number of samples.

As metals have been identified at concentrations exceeding the adopted screening criteria in groundwater within all AECs a consolidated discussion of this issue is presented in *Section 5.5*.

**5.4.2*****MB - Coal Storage Area****Background*

The coal storage area is approximately 16 ha in area and is used for the stockpiling of coal prior to transfer via conveyor to the mill and crusher and then to the boilers. Potential contamination sources or activities include coal stockpiling, use and maintenance of conveyors, coal truck washdown bays

and associated settling ponds, and seepage from contaminated stormwater settling ponds. Refuelling of mobile plant is discussed in *Section 5.4.5*.

It is recognised that the coal conveyor system and associated sediment ponds may represent an AEC (related to mechanical operations (oils) and coal fines that may migrate to Neubecks Creek), however these have not been considered to warrant targeted environmental investigation.

It was considered unlikely that coal storage would represent a significant contamination issue in the context of the site-wide assessment; however, given the absence of previous environmental characterisation work, further investigation was considered to be required to provide a baseline assessment of soil and groundwater conditions in this area.

*AEC Investigation Methodology and Field Observations*

A total of five soil investigation bores, all of which were completed as groundwater monitoring wells, were installed within this AEC. Soil bores and monitoring wells were distributed around the perimeter of the AEC as presented in *Figure 5.2 of Annex A*. Relevant borehole logs are presented within *Annex D*.

No field indicators of contamination, such as staining, odours or visibly stressed vegetation, were noted within this AEC. No staining or unusual odours were detected through the sampled soil profile. Measured concentrations of ionisable volatile compounds via headspace analysis did not exceed 2.1 ppm v (isobutylene equivalent) in any soil sample collected from this AEC.

Field observations during the drilling works are summarised in *Table 5.7*.

**Table 5.3**      *Field Observations Summary - AEC MB*

Borehole ID	Depth (m bgl)	Visual or Olfactory Evidence	PID Range (ppm)
MB_MW01	1.1	None	0
MB_MW02	13.8	None	0-2.1
MB_MW03	8	None	0-0.2
MB_MW04	8.2	None	0
MB_MW05	8	None	0-0.3

Groundwater field parameter readings collected during the groundwater sampling works are presented in *Table 3 of Annex B*. Field parameters were generally within the expected range in this AEC. Electrical conductivity readings indicated fresh water conditions.

No indications of contamination, such as sheen or odours, were observed during groundwater sampling within this AEC.

*Soil Analytical Results*

The soil analytical results have been compared to the adopted human health and ecological screening values as presented in *Table 4.b, Annex B*.

Measured concentrations of COPCs were below the adopted screening values in the soil samples collected from within this AEC. The majority of measured concentrations were below or close to the corresponding laboratory LOR.

Measured concentrations of various heavy metals were above the corresponding laboratory LOR in a number of soil samples collected from within this AEC; however all concentrations were below the adopted screening values.

Asbestos was not detected in soils sampled within this AEC.

*Groundwater Analytical Results*

Groundwater analytical results compared to the adopted screening values are presented in *Table 5.b of Annex B*. Exceedences of the adopted screening values are also graphically presented in *Annex A*.

Measured concentrations of the majority of COPCs were below the laboratory LOR in all groundwater samples collected from within this AEC. The exceptions to this were detections of some metals within groundwater across this AEC.

Manganese, nickel and zinc were detected at concentrations in excess of the adopted ecological screening values in groundwater samples collected from the wells within this AEC. The ecological screening values for groundwater were also exceeded for copper at MB\_MW02, and cadmium and lead at MB\_MW04.

Manganese and nickel were detected in groundwater at concentrations in excess of the human health (drinking water) screening values in groundwater samples collected from monitoring wells within this AEC.

*Discussion*

No exceedences of the adopted ecological or human health screening values were identified in soil samples collected from within this AEC.

Samples collected from all monitoring wells within this AEC were reported with metals concentrations greater than the adopted ecological screening values. Metals exceeding the adopted ecological screening values included cadmium, copper, lead, manganese, nickel and zinc. Concentrations of manganese and nickel in excess of the adopted human health (drinking water) screening values were also detected in a number of samples.

As metals have been identified at concentrations exceeding the adopted screening criteria in groundwater within all AECs a consolidated discussion of this issue is presented in *Section 5.5*.

**5.4.3 MC - Electrical Transformers**

*Background*

Transformers and associated oil storage tanks are located on concrete within a contained area. In general, transformers are considered to be “PCB free”, with transformers tested regularly to assess PCB concentrations. There was a marginal exceedence of the statutory limit under the Environmentally Hazardous Chemicals Act 1985 for the notification of PCBs (Unit 2B 11/3.3kV Auxiliary Transformer) of 2 ppm (mg/kg) with 3.1 ppm (mg/kg). Delta did not report any spills within the transformer area and given the general level of housekeeping and monitoring, it is considered unlikely that a release of significant quantity has occurred and not been reported.

This area was considered to represent a relatively low risk in the context of this assessment, given the absence of any known historical release and the low likelihood of a pathway to soil and groundwater. However, in the absence of previous environmental characterisation work, further investigation was considered to be required to provide a baseline of soil and groundwater conditions in this area.

*AEC Investigation Methodology and Field Observations*

A total of four soil investigation bores, all of which were completed as groundwater monitoring wells, were installed within this AEC. Soil bores and monitoring wells were distributed around the perimeter of the AEC as presented in *Figure 5.3 of Annex A*. Relevant borehole logs are presented within *Annex D*.

No field indicators of contamination, such as staining, odours or visibly stressed vegetation, were noted within this AEC. No staining or unusual odours were detected through the sampled soil profile. Measured concentrations of ionisable volatile compounds via headspace analysis did not exceed 1.1 ppm v (isobutylene equivalent) in any soil sample collected from this AEC.

Field observations during the drilling works are summarised in *Table 5.7*.

**Table 5.4 Field Observations Summary – AEC MC**

Borehole ID	Depth (m bgl)	Visual or Olfactory Evidence	PID Range (ppm)
MC_MW01	5.5	None	0.4- 2.0
MC_MW02	5	None	0.2-1.4
MC_MW03	5	None	0.1-0.6
MC_MW04	6.2	None	0.5-1.4

Groundwater field parameter readings collected during the groundwater sampling works are presented in *Table 3 of Annex B*. Field parameters were generally within the expected range in this AEC. Electrical conductivity readings indicated fresh water conditions.

No indications of contamination, such as sheen or odours, were observed during groundwater sampling within this AEC. A summary of field observations from the groundwater sampling works are presented within *Table 3 of Annex B*.

#### *Soil Analytical Results*

The soil analytical results have been compared to the adopted human health and ecological screening values as presented in *Table 4.c of Annex B*.

Measured concentrations of COPCs were below the adopted screening values in the soil samples collected from within this AEC. The majority of measured concentrations were below or close to the corresponding laboratory LOR. TRH fractions were detected in soil collected from MC\_MW04 at a depth of 0.15 m bgl. These concentrations did not exceed adopted screening values.

Measured concentrations of various heavy metals were above the corresponding laboratory LOR in a number of soil samples collected from within this AEC; however all concentrations were below the adopted screening values.

Asbestos was not detected in soils sampled from within this AEC.

#### *Groundwater Analytical Results*

Groundwater analytical results compared to the adopted screening values are presented in *Table 5.c, Annex B*. Exceedences of the adopted screening values are also graphically presented in *Annex A*.

Measured concentrations of the majority of COPCs were below the laboratory LOR in all groundwater samples collected from within this AEC. The exceptions to this were detections of some metals within groundwater across this AEC.

Manganese, nickel, zinc were detected at concentrations in excess of the adopted ecological screening values in groundwater samples collected from the wells within this AEC. The ecological screening values for groundwater were also exceeded for copper and lead at MC\_MW02 and ML\_MW12, and arsenic and cadmium at MC\_MW04 and ML\_MW15. The concentration of arsenic reported at MC\_MW04 exceeded human health (drinking water and recreational) screening values. The concentration of arsenic at ML\_MW15 exceeded the human health (drinking water) screening values.

Manganese and nickel were detected in groundwater at concentrations in excess of the human health (drinking water) screening values in groundwater samples collected from monitoring wells within this AEC. Manganese was detected in groundwater at concentrations in excess of the human health (recreational) screening values at MC\_MW03.

#### *Discussion*

No exceedences of the adopted ecological or human health screening values were identified in soil samples collected from within this AEC.

Samples collected from all monitoring wells within this AEC were reported with metals concentrations greater than the adopted ecological screening values. Metals exceeding the adopted ecological screening values included arsenic, cadmium, copper, lead, manganese, nickel, zinc. Concentrations of arsenic, lead, manganese and nickel in excess of the adopted human health (drinking water) screening values were also detected in a number of samples. Concentrations of arsenic in excess of human health (recreational) screening values were detected in one sample collected from MC\_MW04.

As metals have been identified at concentrations exceeding the adopted screening criteria in groundwater within all AECs a consolidated discussion of this issue is presented in *Section 5.5*.

#### **5.4.4**

#### ***MD - Workshops***

##### *Background*

Maintenance workshops are located within the main operational areas of the Site at:

- the western side of the main plant, behind Unit 2 (AEC MK);
- the south-east corner of the coal handling area (this is a combined workshop and mobile plant refuelling area (AEC ME)); and
- bulk chemical storage is located adjacent to the stores building (AEC MJ).

As the workshops are located within the main operational areas of the Site, potential contamination issues have been addressed in other AECs, including MK (Operational Areas), ME (Mobile Plant Refuelling Area) and MJ (Operational USTs) which are located adjacent to the stores building. Monitoring wells and soil bores in these areas are discussed in the relevant sections.



Site management indicated that the workshops have remained in the same location since plant operation commenced. Delta management reported that some chlorinated hydrocarbons such as “Dev-Tap” (1,1,1, Trichloroethane) have been used historically, but that such products are no longer used. A separate known issue relating to fuel storage is discussed in *Section 5.4.5*. Previous soil and groundwater investigations have been conducted around the underground fuel infrastructure, and did not include laboratory analysis of soils (as discussed in *Section 5.4.10*). Therefore further investigation was considered to be required to provide a baseline for soil and groundwater conditions in this area.

*AEC Methodology and Investigation Field Observations*

A total of four soil investigation bores, three of which were completed as groundwater monitoring wells, were installed within this AEC to assess potential impacts to soil and groundwater. In addition, soil bores and monitoring wells installed in AEC ME (Mobile Refuelling Plant) and MK (Operational Areas), and existing wells in AEC MJ (Operational USTs) also target the workshop areas. Sampling locations were distributed around the AEC as presented in *Figure 5.3 of Annex A*. Relevant borehole logs are presented within *Annex D*.

No field indicators of contamination, such as staining, odours or visibly stressed vegetation were noted within this AEC. No staining or unusual odours were detected at any depth through the sampled soil profile. Measured concentrations of ionisable volatile compounds via headspace analysis typically did not to exceed 1.8 ppm v (isobutylene equivalent), with the exception of one sample from MD\_MW04 which reported a concentration of 81.7 ppm v (isobutylene equivalent).

A summary of the field observations from the drilling works are presented within *Table 5.5*.

**Table 5.5** *Field Observations Summary - AEC MD*

Borehole ID	Depth (m bgl)	Visual or Olfactory Evidence	PID Range (ppm)
MD_MW01	7	None	0- 0.6
MD_MW02*	1.8	None	1.6-1.8
MD_MW03	4	None	0.8-1.7
MD_MW04	6	Hydrocarbon odour	1.1-81.7

Notes: \* soil bore only as monitoring well could not be installed due to refusal at shallow depth and proximity to sub-surface utilities.

Groundwater samples were collected from the three monitoring wells located within this AEC. Groundwater parameter readings collected during the groundwater sampling works are presented in *Table 3 of Annex B*. Field parameters were generally within the expected range in this AEC. Electrical conductivity readings indicated fresh water conditions.

A light oily sheen was observed during groundwater purging at MD\_MW04. No indications of contamination, such as sheen or odours, were observed during groundwater sampling at MD\_MW02 and MD\_MW03. A summary of field observations from the groundwater sampling works are presented within *Table 3 of Annex B*.

#### *Soil Analytical Results*

The soil analytical results have been compared to the adopted human health and ecological screening values as presented in *Table 4d of Annex B*. Exceedences of the adopted screening values are also graphically presented in *Figure 8.1 to 8.9 of Annex A*.

Measured concentrations of all COPCs with the exception of TRH C<sub>10</sub>-C<sub>16</sub> and TRH C<sub>16</sub>-C<sub>34</sub> (discussed below) were below the adopted screening values in all soil samples collected from within this AEC. The majority of measured concentrations were below or close to the corresponding laboratory LOR.

Concentrations of some TRH fractions were reported above the corresponding laboratory LOR in soil collected from 1.2 m bgl at MD\_MW04. All concentrations were below the adopted screening values with the exception of TRH C<sub>10</sub>-C<sub>16</sub> and TRH C<sub>16</sub>-C<sub>34</sub> which exceeded the adopted ESLs. Concentrations of various heavy metals were above the corresponding laboratory LORs in a number of soil samples collected from within this AEC however all concentrations were below the adopted screening values.

Asbestos was not detected in soils sampled from within this AEC.

#### *Groundwater Analytical Results*

Groundwater analytical results compared to the adopted screening values are presented in *Table 5.d of Annex B*. Exceedences of the adopted screening values are also graphically presented in *Figure 8.1 to 8.9 of Annex A*.

Measured concentrations of the majority of the COPCs were below the laboratory LOR in all groundwater samples analysed. The exceptions to this were some detections of metals within groundwater across this AEC.

Manganese, nickel and zinc were detected at concentrations in excess of the adopted ecological screening values in groundwater samples collected from all groundwater monitoring wells within this AEC. The ecological screening values for groundwater were also exceeded for arsenic at MD\_MW04, cadmium at MK\_MW01, chromium at MD\_MW03, copper at MK\_MW08 and lead at MD\_MW03 and MK\_MW08.

Manganese and nickel were detected in groundwater at concentrations in excess of the human health (drinking water) screening values in groundwater samples collected from monitoring wells within this AEC.

The concentration of lead reported at MD\_MW03 exceeded human health (drinking water) screening values.

#### *Discussion*

No exceedences of the adopted ecological or human health screening values were identified in soil samples collected from within this AEC with the exception of concentrations of TRH C<sub>10</sub>-C<sub>16</sub> and TRH C<sub>16</sub>-C<sub>34</sub> in soil collected from 1.2 m bgl at MD\_MW04 which exceeded the adopted ESLs. The hydrocarbon impacts identified at this location may be related to historical leaks or spills associated with workshop activities in this area. Area MD is largely covered in concrete hardstanding, with some grass areas around service easements. Area MD is not considered to have any significant ecological value and thus the application of the ESLs is considered to be overly conservative in this instance.

Samples collected from all monitoring wells within this AEC were reported with metals concentrations greater than the adopted ecological screening values. Metals exceeding the adopted ecological screening values included arsenic, cadmium, chromium, copper, lead, manganese, nickel, zinc. Concentrations of manganese and nickel in excess of the adopted human health (drinking water) screening values were also detected in a number of samples. Concentrations of lead in excess of human health (drinking water) screening values were detected in one sample collected from MD\_MW03. As metals have been identified at concentrations exceeding the adopted screening criteria in groundwater within all AECs a consolidated discussion of this issue is presented in *Section 5.5*.

### **5.4.5 ME - Mobile Plant Refuelling Area**

#### *Background*

The mobile plant refuelling area is located adjacent to the coal storage area and is used by large mobile plant. The infrastructure consists of a shed, small workshop and a wash bay, with a diesel UST and bowser located on the southern side of the wash bay. A washdown pit and a "bobcat pit" are located adjacent to the day maintenance workshop and the integrity of this in-ground pit is unknown. The wash bay drains to an oil-water separator located on the northern side of the wash bay. The oil-water separator drains through an underground pipe in a north-easterly direction, discharging into an open surface water drain along the coal storage area boundary. The bobcat pit drains to an oil collection pit which is pumped out by a road tanker. Although a covered concrete platform is provided at the mobile plant yard, the ground immediately surrounding the mobile plant area is unsealed and there was staining observed on bare ground beneath the large mobile plant.

Light non-aqueous phase liquid (LNAPL) has been previously identified in a groundwater monitoring well (MWMP8) on the northern side of the wash bay, adjacent to the oil-water separator in October 2012 (SMEC, 2012). Further investigations were undertaken, including integrity testing and excavation to inspect the UST and lines, which indicated no issues with the UST. Hydrocarbon fingerprint analysis was undertaken on samples of the diesel from the UST and the LNAPL in March 2013. The LNAPL was weathered with an age estimate of 25 years and was hence considered to be unrelated to the diesel currently in the UST. Other potential sources of historical petroleum releases include an aboveground release (spill from tanker or unknown AST), linework failure, or potentially unknown USTs.

The PESA (ERM, 2013b) considered further investigation was warranted to assess the potential for soil and ground contamination.

#### *AEC Methodology and Investigation Field Observations*

Proposed investigation locations in this AEC, as stated in the SAQP (ERM, 2013a), included four soil investigation bores, all of which were proposed to be completed as groundwater monitoring wells. Sub-surface clearance was undertaken at the four proposed monitoring well locations, and NDD was completed on 14 November to a depth of 1.5 m bgl in preparation for drilling to the target depth, estimated at 6 m bgl. Drilling of these four locations was scheduled for 18 November 2013. On arrival at Site on 18 November a drill rig under the direction of another consultant, SMEC, had begun drilling of monitoring wells in this area under directions from Energy Australia. ERM therefore ceased work in this AEC until the SMEC investigation was completed.

SMEC installed five groundwater monitoring wells in this AEC on 18 and 19 November 2013, including four monitoring wells and one recovery well (SMEC, 2014). The findings of the SMEC investigation are reported in the report *Installation and Monitoring of Plume Delineation Groundwater Wells - Bulldozer Workshop - Mt Piper Power Station* (SMEC, 2014). The stated objectives of the SMEC investigation were to delineate the extent of the previously identified hydrocarbon plume, install a product recovery well within the area of the identified plume and advise Energy Australia of likely remedial actions and steps/obligations in relation to the identified hydrocarbon contamination (SMEC, 2014).

The scope of works completed by ERM in this AEC was modified following the completion of the five additional groundwater wells by SMEC described above. Of the proposed ERM soil investigation bores, three locations were abandoned following NDD, and one location (inferred up-gradient of the identified LNAPL plume) was completed as a groundwater monitoring well (ME\_MW04). The three soil investigation bores (ME\_SB01, ME\_SB02 and ME\_SB03) were completed to a depth of 1.5 m bgl and soil samples were analysed for the COPCs.

The scope of works for this AEC completed by ERM as part of this Phase 2 ESA included four soil investigation bores, one of which was completed as a groundwater monitoring well. Soil samples were collected from the four ERM soil bore locations (ME\_SB01, ME\_SB02, ME\_SB03 and ME\_MW04). The depth to groundwater was gauged at all nine groundwater wells, including the recovery well, and LNAPL was detected in four locations. For clarity, a summary of monitoring well installations in this AEC is provided in *Table 5.6* below.

**Table 5.6** *Summary of Wells in AEC ME*

Borehole ID	Alternate Name	Well Depth (m bgl)	Location Relative to Source
ME_X_MW01	MWMP09#1	6	Up-gradient, to west of workshop.
ME_X_MW02	MWMP10#1	7.5	Cross-gradient of ME_X_MWMP8*
ME_X_MW03*	MWMP12#1	7.5	Down-gradient of ME_X_MWMP8*
ME_X_MW05	MWMP11#1	6	Cross-gradient of ME_X_MWMP8*
ME_X_MW06	MWMP14#1	6	Down-gradient of ME_X_MWMP8*
(Recovery Well)	MWMP13#1		Adjacent to ME_X_MWMP8*
ME_X_MWMP7*	MWMP07#2	6	Adjacent to UST & bowser
ME_X_MWMP8*	MWMP08#2	4	Adjacent to oil-water interceptor
ME_MW04	ERM1#3	7.8	Up-gradient of UST & bowser

1. Well installed by SMEC (Dec 2011); note the recovery well was not sampled by ERM.  
 2. Well installed by SMEC (Nov 2013)  
 3. Well installed by ERM (Nov 2013). SMEC (2014) used alternate name "ERM1".  
 \* well detected LNAPL  
 ^LNAPL detected during gauging in November 2013, prior to drilling works.

Monitoring wells were distributed with one up, one across and two on the down hydraulic gradient side of the existing groundwater monitoring well ME\_X\_MWMP8 where LNAPL had historically been reported. The sampling locations (both those installed by ERM and those installed by others) within this AEC are presented on *Figure 5.3* of *Annex A*. Relevant borehole logs are presented within *Annex D*.

It was observed that the ground surface within this AEC was unsealed, with coal present at the surface, and staining evident on the ground surface.

During drilling by ERM no staining or unusual odours were detected at depth through the sampled soil profile. Measured concentrations of ionisable volatile compounds via headspace analysis were noted not to exceed 0.7 ppm v (isobutylene equivalent) in any soil sample collected from this AEC. Borelogs from the investigation completed by SMEC (2014) indicate hydrocarbon odours and LNAPL sheen at 5 m bgl at MWMP10 and a hydrocarbon odour at MWMP12

A summary of the field observations from the drilling works by ERM are presented within *Table 5.7*.

**Table 5.7** *Field Observations Summary - AEC ME - Soil*

Borehole ID	Depth (m bgl)	Visual or Olfactory Evidence	PID Range (ppm)
ME_SB01	1.5	None	0.1-0.2
ME_SB02	1.5	None	0-0.3
ME_SB03	1.5	None	0.3-0.6
ME_MW04	12.5	None	0.3-0.7

Groundwater samples were collected from the five monitoring wells located within this AEC, with no samples collected from three monitoring wells where LNAPL was detected, and no sample was collected from the recovery well. Groundwater parameter readings collected during the groundwater sampling works are presented in *Table 3 of Annex B*. Field parameters were generally within the expected range in this AEC. Electrical conductivity readings indicated fresh water conditions.

LNAPL was detected during groundwater gauging in three groundwater monitoring wells within this AEC, as summarised in *Table 5.8* below. The presence of LNAPL was visually confirmed with a clear plastic bailer. No other indications of contamination, such as sheens or odours were observed during groundwater sampling within this AEC. A summary of field observations from the groundwater sampling works are presented within *Table 3 of Annex B*.

**Table 5.8** *Field Observations Summary - AEC ME - Groundwater*

Borehole ID	LNAPL thickness (mm)	Depth to LNAPL (m bgl)
ME_X_MWMP7	2	5.377
ME_X_MWMP8	200	3.425
ME_X_MW03	5	5.154

#### *Soil Analytical Results*

The soil analytical results have been compared to the adopted human health and ecological screening values as presented in *Table 4e of Annex B*.

Measured concentrations of COPCs were below the adopted screening values in all soil samples collected from within this AEC. The majority of measured concentrations were below or close to the corresponding laboratory LOR.

Measured concentrations of various heavy metals were above the corresponding laboratory LOR in a number of soil samples collected from within this AEC however all concentrations were below the adopted screening values.

Asbestos was not detected in soils sampled within this AEC.

*Groundwater Analytical Results*

Groundwater analytical results compared to the adopted screening values are presented in *Table 5.e of Annex B*. Exceedences of the adopted screening values are also graphically presented in *Figure 8.1 to 8.9 of Annex A*.

LNAPL was detected in three groundwater monitoring wells within this AEC. Measured concentrations of the majority of the COPCs were below the laboratory LOR in all groundwater samples analysed. The exceptions to this were some detections of metals within groundwater across this AEC.

Manganese, nickel and zinc exceeded the adopted ecological screening values in groundwater samples collected from all groundwater monitoring wells within this AEC. At monitoring well ME\_MW04 the measured concentration of copper also exceeded the adopted ecological screening values. Manganese exceeded the adopted human health screening values (drinking water and recreational) in groundwater samples collected from all groundwater monitoring wells within this AEC. Nickel exceeded the adopted human health screening values (drinking water) in groundwater samples collected from all groundwater monitoring wells within this AEC, and also exceeded the human health screening values (recreational) at ME\_MW04.

*Discussion*

No exceedences of the adopted ecological or human health screening values were identified in soil samples collected from within this AEC. However, LNAPL was detected in three groundwater monitoring wells. Further discussion on the issue of LNAPL in this AEC is provided in *Section 5.6.2*.

Samples collected from all monitoring wells within this AEC were reported with metals concentrations greater than the adopted ecological screening values. Metals exceeding the adopted ecological screening values included copper, manganese, nickel, zinc. Concentrations of manganese and nickel in excess of the adopted human health (drinking water and recreational) screening values were also detected in a number of samples.

As metals have been identified at concentrations exceeding the adopted screening criteria in groundwater within all AECs a consolidated discussion of this issue is presented in *Section 5.5*.

**5.4.6*****MF - Operational ASTs****Background*

Operational above-ground storage tanks at the Site include a 28 000 L diesel AST located near the ash repository; sulfuric, caustic and alum tanks at the demineralisation plant; and a refined recycled oil (RRO) installation on the south east corner of the operational area.

The demineralisation plant was assessed as part of the operational area (Area MK, see *Section 5.4.11*).

The fuel (RRO) installation investigated as part of this assessment was installed in 1990/91 and consists of two bunded 1.2 ML steel tanks, an unloading station for unloading two road tankers simultaneously and a small 36 kL overflow tank (Worley Parsons 2013). The ASTs are filled by road tankers, with gravity pipes (in concrete lined trenches) transporting fuel to dedicated duty and standby ignition oil pumps for each boiler (Worley Parsons 2013). There were no reported leaks or spills associated with the RRO. Potentially significant releases of fuel associated with the ASTs and/or pipework would likely be accounted for in the fuel reconciliations. Fuel is metered when delivered and when used, and the tanks are gauged periodically (Worley Parsons 2013). Fuel reconciliations are undertaken to account for any potential loss of fuel. Tank integrity tests are reported to be undertaken across the site on a routine basis. Documentation relating to the tank integrity testing and fuel reconciliations was not available at the time of the PESA, however was reported by Worley Parsons (2013).

It is considered unlikely that there have been potentially significant releases from the ASTs given that they are located within a concrete lined bunded area and any potential leaks or spills would be immediately evident, and would be contained within the bunded area. The potential for unknown leaks from the fuel oil pipeline is unlikely given that it is located within a concrete lined trench, which can be access via ground level covers for inspection and any potential leaks or spills would be evident from staining on the concrete.

A water retention pond is located approximately 60 m to the north and down-slope of the RRO ASTs. The pond receives discharge from an oil water interceptor which appears to collect water from inside the bund of the AST. The side walls of the pond were heavily stained black and the pond did not appear to be lined. A sheen was noted on the water in the pond. Maintenance works were carried out during the site investigation works, which involved pumping of water into a waste water truck.

Given the absence of previous environmental investigations the PESA concluded that further investigation was warranted to assess potential soil and groundwater contamination issues associated with the fuel (RRO) installation in this AEC.

#### *Methodology and Investigation Field Observations*

A total of five soil investigation bores were drilled and converted to monitoring wells within this AEC. One monitoring well was installed upgradient, and two downgradient of the RRO tank farm. Two additional monitoring wells were installed down-gradient of the water retention pond near the RRO.



A groundwater sample was collected from an existing monitoring well, MG\_X\_MP1, located near the diesel AST near the ash repository. No leaks or spills have been reported in this area, and the potential for unknown leaks from infrastructure is unlikely given that the infrastructure is above-ground, therefore no further investigations were targeted at this area.

The sampling locations within this AEC are presented on Figures 5.4 and 5.5 of Annex A. Relevant borehole logs are presented within Annex D.

With the exception of the observations of the water retention pond described above, no field indicators of contamination, such as staining, odours or visibly stressed vegetation were noted within this AEC. Soil sampling was limited to less than 0.45 m bgl, with shale bedrock encountered in all locations at depths between 0.2 and 0.45 m bgl. No staining or unusual odours were detected at any depth through the sampled soil and rock profile. Measured concentrations of ionisable volatile compounds via headspace analysis sampled from surface soils did not exceed 0.2 ppm v (isobutylene equivalent).

A summary of the field observations from the drilling works are presented in *Table 5.9*.

**Table 5.9** *Field Observations Summary – AEC MF*

Borehole ID	Depth (m bgl)	Visual or Olfactory Evidence	PID (ppm v - isobutylene equivalents)
MF_MW01	16	None	0.2
MF_MW02	25	None	0.0
MF_MW03	13	None	0.0
MF_MW04	15.8	None	0.0
MF_MW05	27	None	0.0

Groundwater parameter readings collected during the groundwater sampling works are presented in *Table 3 of Annex B*. No evidence of contamination was reported during groundwater sampling.

#### *Soil Analytical Results*

The soil analytical results have been compared to the adopted human health and ecological screening values as presented in *Table 4.f of Annex B*. Exceedences of the adopted screening values are also graphically presented in *Figure 7 of Annex A*.

Measured concentrations of all COPCs were below the adopted screening values in all soil samples collected from within this AEC. The majority of measured concentrations were below or close to the corresponding laboratory LOR. Concentrations of TRH C<sub>16</sub>-C<sub>34</sub> and total PAHs were above the corresponding laboratory LORs in soil samples at 0.2 m bgl from MF\_MW03 and total PAHs at 0.2 m bgl from MF\_MW05 however all concentrations were below the adopted screening values.

Measured concentrations of various heavy metals were above the corresponding laboratory LOR in a number of soil samples collected from within this AEC however all concentrations were below the adopted screening values. Asbestos was not detected in soils sampled within this AEC.

#### *Groundwater Analytical Results*

Groundwater analytical results compared to the adopted screening values are presented in *Table 5.f of Annex B*. Exceedences of the adopted screening values are also graphically presented in *Figure 8.1 to 8.9 of Annex A*.

Measured concentrations of the majority of the COPCs were below the laboratory LOR in all groundwater samples analysed. The exceptions to this were some detections of metals within groundwater across this AEC.

Copper, manganese, nickel and zinc were detected at concentrations in excess of the adopted ecological screening values in groundwater samples collected from all groundwater monitoring wells within this AEC. Lead was detected at concentrations in excess of the adopted ecological screening values in groundwater sampled from MF\_MW03. Cadmium was detected at concentrations in excess of the adopted ecological and human health (drinking water) screening values in groundwater sampled from MG\_X\_MP1. Nickel and manganese also exceeded the human health (drinking water) screening values in all sampled groundwater monitoring wells in this AEC.

#### *Discussion*

No exceedences of the adopted human health or ecological screening values were identified in soil samples collected from within this AEC.

Groundwater flow direction is variable within this AEC and appears to flow in a south-west and north-easterly direction. Based on the geology and water strike observed during well installation, a fault is inferred to run north-south through the centre of the AST farm which appears to influence groundwater flow. Groundwater is inferred to be present between 11 and 25 m bgl, under semi-confined conditions within coarse sandstone and a coal seam.

All six of the groundwater monitoring wells sampled reported metals concentrations greater than the adopted human health and ecological screening values. Metals exceeding the adopted ecological screening values included copper, lead, manganese, nickel and zinc. Manganese and nickel concentrations in excess of the adopted human health (drinking water) screening values were also reported in a number of samples. Elevated heavy metal concentrations in groundwater sampled from upgradient well MF\_MW03 correlate with slightly acidic pH in this location.

As metals have been identified at concentrations exceeding the adopted screening criteria in groundwater within all AECs a consolidated discussion of this issue is presented in *Section 5.5*. The groundwater results do not indicate significant hydrocarbon impacts in groundwater relating to the fuel infrastructure in this AEC.

#### 5.4.7 *MG - Current Ash Repository*

##### *Background*

The current ash repository is located directly to the north east of the Power Station, in the former Western Main open-cut mine void. The AEC MG refers to the ash repository currently in operation, as the recent extension to Lamberts North was completed in mid-2013, however was not yet in active operation at the time of completion of the investigation works described herein. The Lamberts North Ash Repository is discussed separately in *Section 5.4.8*.

The current ash repository covers an area of approximately 40 ha and has been operational since the first power generating unit came on-line at Mount Piper Power Station in 1993. The ash repository was designed for dry ash placement, with water addition being limited to water added for ash conditioning prior to disposal and dust suppression following disposal.

Brine conditioned ash is currently disposed in a designated area of the ash repository as permitted by the EPL (GHD, 2012). Seepage from the ash repository has the potential to be saline and contain heavy metals, and routine groundwater monitoring in compliance with the EPL is undertaken in accordance with the *Mt Piper Power Station Brine Conditioned Flyash Co-placement Extension Water Management and Monitoring Plan (WMP)* (Connell Wagner, 2008). The amended WMP, including the extension to Lamberts North, was approved by the NSW Department of Planning, with comments provided by NSW Office of Water and NSW EPA. The WMP includes guidelines for the receiving waters of Huons Pond and Neubecks Creek, and also locally derived ANZECC guideline trigger concentrations for groundwater. These guidelines and receiving water sites have been used for assessment of the Stage I and II brine placements since brine conditioned ash placement began at the Mt Piper Stage I site in 2000.

Recent earthworks have diverted surface water drainage away from the former Huons Gully which was located on the boundary between the existing ash repository and the extension in Lamberts North. Until 2013, surface water drainage along Huons Gully discharged into the Huon Pond (formerly known as the Groundwater Collection Basin), which was also reportedly in contact with groundwater at the base of the former Lamberts Gully Mine. Huon Pond subsequently discharged to Neubecks Creek.

The Huon Pond was filled as part of construction of the Lamberts North Ash Repository in 2013, and ERM understands that surface water drainage does not currently discharge directly to Neubecks Creek from the ash repository.

Annual groundwater monitoring is routinely undertaken at the repository for a range of potential constituents of concern including salinity, pH, heavy metals and chloride (used as tracer for brine mobilisation) (Aurecon, 2012). In previous investigations, elevated boron and sulfate concentrations have been attributed to historical coal mining operations, and a marked increase in chloride concentrations in monitoring bore MPM4/D10 was considered to be caused by seepage from the coal washery rejects ponds (Aurecon, 2012). A groundwater quality review undertaken in 2011 further found that surface and groundwater quality guidelines (as defined in the Water Management and Monitoring Plan (Connell Wagner, 2008) in the receiving waters of the Neubecks Creek and Huon Pond continued to be met.

While considerable environmental assessment has been undertaken in this area, it was not considered that suitable characterisation of environmental conditions has been established for the purpose of establishing a baseline of conditions as at or near the time of the transaction. ERM also understands that samples collected during groundwater monitoring have been taken with bailers and that metal samples collected during groundwater monitoring in recent years have not been field-filtered (Aurecon, 2012). Purging and sampling using bailers for the full suite of PCOCs considered in the course of this assessment is not recommended due to the difficulty of obtaining a representative groundwater samples owing from potential degassing of samples and the potential introduction of high levels of turbidity (NEPC 2013).

The PESA therefore recommended further assessment of this area via sampling of existing wells (using low-flow sampling and in-field filtering), and some limited additional intrusive assessment for soil characterisation.

#### *AEC Methodology and Investigation Field Observations*

Two soil investigation bores were advanced within this AEC to characterise fill materials on the perimeter wall of the ash repository. Mine overburden was encountered in both locations, consistent with known construction of the ash repository, with refusal encountered at 0.45m bgl on boulders at both locations. Six existing groundwater monitoring wells on the boundary of the ash repository were additionally sampled as part of this ESA. The sampling locations within this AEC are presented on *Figure 5.5 of Annex A*. Relevant borehole logs are presented within *Annex D*.

No field indicators of contamination, such as staining or odours were noted within this AEC. No staining or unusual odours were detected at any depth through the sampled soil. Measured concentrations of ionisable volatile compounds via headspace analysis were noted in the two samples collected at 0.8 and 1.0 ppm v (isobutylene equivalent).

A summary of the field observations from the drilling works are presented within *Table 5.10* (below).

**Table 5.10** *Field Observations Summary – AEC MG*

Borehole ID	Depth (m bgl)	Visual or Olfactory Evidence	PID Range (ppm)
MG_SB01	0.45	None	0.8
MG_SB02	0.45	None	1.0

Groundwater samples were collected from the seven existing monitoring wells located within this AEC. Groundwater parameter readings collected during the groundwater sampling works are presented in *Table 3 of Annex B*. Field parameters were generally within the expected range, with the exception of pH. EC readings indicated that groundwater conditions were fresh in wells on the northern perimeter of the ash repository and saline in wells on the eastern perimeter of the ash repository, adjacent to the Lamberts North Ash Repository. The measured pH was slightly acidic (5.32 to 6.15) in most locations, with the exception of MG\_X\_4/D4 which had an acidic pH of 3.31. The acidic conditions at MG\_X\_4/D4 are likely related to the presence of mine spoil indicated on historical drawings (PPK, 2000). Borelogs for existing well MG\_X\_4/D4 also indicate this well is screened in mine overburden.

No indications of contamination, such as sheens or odours, were observed during groundwater sampling within this AEC. A summary of field observations from the groundwater sampling works are presented within *Annex E*.

#### *Soil Analytical Results*

The soil analytical results have been compared to the adopted human health and ecological screening values as presented in *Table 4g of Annex B*.

Measured concentrations of various heavy metals were above the corresponding laboratory LOR in a number of soil samples collected from within this AEC however all concentrations were below the adopted screening values. Asbestos was not detected in soils sampled within this AEC.

#### *Groundwater Analytical Results*

Groundwater analytical results compared to the adopted screening values are presented in *Table 5g of Annex B*. Exceedences of the adopted screening values are also graphically presented in *Figure 8.1 to 8.9 of Annex A*.

Measured concentrations of all COPCs were below the laboratory LOR in all groundwater samples analysed, with the exception of metals.

Arsenic, boron, cadmium, chromium, copper, lead, manganese, nickel and zinc were detected at concentrations in excess of the adopted ecological screening values in most groundwater samples within this AEC. Boron, cadmium, lead and manganese were detected at concentrations in excess of the adopted human health (drinking water) screening values. Arsenic and nickel were detected at concentrations in excess of the adopted human health (drinking water and recreational) screening values.

#### *Discussion*

Groundwater is inferred to flow in a north-easterly direction, consistent with previous investigations. Neubecks Creek is situated within 100 m of the northern boundary of the ash repository and is the nearest surface water body and potential ecological receptor.

No exceedences of the adopted ecological or human health screening values were identified in soil samples collected from within this AEC.

All seven of the groundwater monitoring wells reported metals concentrations greater than the adopted human health and/or ecological screening values. Metals exceeding the adopted ecological screening values included arsenic, boron, chromium, cadmium, copper, lead, manganese, nickel and zinc. Arsenic, boron, chromium, cadmium, copper, lead, manganese and nickel concentrations in excess of the adopted human health (drinking water and/or recreational) screening values were also reported in a number of samples. Arsenic and nickel concentrations also exceeded the adopted human health (recreational) screening values.

As metals have been identified at concentrations exceeding the adopted screening criteria in groundwater within all AECs a consolidated discussion of this issue is presented in *Section 5.5*. This discussion also includes consideration of groundwater salinity.

#### **5.4.8** *MH - Lamberts North Ash Repository*

##### *Background*

The Lamberts North ash repository is an extension of the current ash repository located to the south-east and adjacent to the existing ash repository. The Lamberts North ash repository was constructed on former open cut mine workings which formerly extended to the base of the Lithgow Seam. The repository was constructed in 2013 with a 5 m fill layer above the base of the former mine, which was in direct contact with groundwater within the Lithgow Seam (SKM, 2010). The placement of fill material prior to ash deposition is intended to provide a barrier to groundwater infiltration of the ash, and prevent potential leaching of contaminants from the ash to groundwater. The repository receives dry ash with water used for dust control only.

It is noted that the construction of the Lamberts North Ash Repository was approved by the Minister for Planning and Infrastructure under the *Environmental Planning and Assessment Act 1979* (NSW). The conditions of approval include surface water and groundwater monitoring. A Water Management Plan (WMP, Connell Wagner, 2008) was approved as part of the planning approval. The WMP includes groundwater and surface water monitoring during construction and operation of the ash repository (as discussed in *Section 5.4.7*) along with a requirement to prepare and submit an annual report (including the results of monitoring) to NSW EPA.

Construction of was completed in May 2013 in the northern section of this AEC (see *Figure 5.6, Annex A*), with some ash placement, however this facility has not yet commenced full operations. The remainder of the Lamberts North AEC has not yet been developed for ash placement, and generally remains in the condition at the time of transfer from Centennial Coal at the closure of the former mine.

Two unlined coal washery reject ponds were constructed by Centennial Coal along the former drainage line (known as Huon's Gully). These were constructed on a disturbed creek bed and open cut mine filled with overburden, and are reportedly approximately 20 m deep from surface to former base level. Seepage from washery rejects ponds has the potential to enter groundwater. Potential contamination concerns to groundwater include impact from dissolved salts and heavy metals, and annual groundwater monitoring identified a marked increase in chloride concentrations in monitoring bore MPM4/D10 which is considered to be caused by seepage from the coal washery rejects (CDM Smith, 2012).

A drainage channel was constructed in mid-2013 to divert current surface water flow away from Huon's Gully, and along the boundary between Lamberts North and the ridge to the west. The intent of the drainage channel is to divert up-gradient surface water runoff around the ash repository, and the rejects ponds. This diverts any further inflows of water to the extension to the ash repository and a fresh water pond located to the south of the second washery rejects pond. The fresh water pond is separated from the coal washery reject ponds by a poorly battered earthen dam wall.

Delta management reported that the freshwater pond was temporarily used to direct water from the Huon Void. The freshwater pond is blocked from down-gradient drainage, and the ultimate receiver of waters from this pond is unclear.

As discussed in *Section 5.4.7*, seepage from the ash repository has the potential to be saline and contain dissolved salts and heavy metals.

However, as noted previously, the facility has been designed and constructed in a manner that reduces the potential for these impacts to reach groundwater (ie by filling the base of the former mine with 5 m of fill prior to placement, thus elevating the ash above the water table). Former coal mining operations have also been noted to be potential sources of these contaminants. These include the underground mine workings (goaf), located along the western boundary of the AEC, and the coal reject ponds located adjacent to the western boundary.

The *Preliminary ESA* (ERM, 2013) concluded that whilst some environmental assessment has been undertaken in this area, it was not considered that suitable characterisation of environmental conditions has been established, and further investigation was warranted to provide a baseline assessment of soil and groundwater conditions.

*AEC Methodology and Investigation Field Observations*

Four soil investigation bores were drilled within this AEC. Three of these were converted into groundwater monitoring wells. A surface sediment sample was also collected from the coal washery rejects pond (MH\_SS02). The sampling locations within this AEC are presented on *Figure 5.5* of *Annex A*. Relevant borehole logs are presented within *Annex D*.

No staining or unusual odours were detected at any depth through the sampled soil profile. Measured concentrations of ionisable volatile compounds via headspace analysis were noted not to exceed 1.5 ppm v (isobutylene equivalent) in any soil sample collected from this AEC.

A summary of the field observations from the drilling works are presented within *Table 5.11*.

**Table 5.11** *Field Observations Summary - AEC MH*

Borehole ID	Depth (m bgl)	Visual or Olfactory Evidence	PID Range (ppm v - isobutylene equivalents)
MH_MW01	30	None	0.1- 2
MH_MW02	15.5	None	0.1-1.5
MH_MW03	28.5	None	0.1- 0.6
MH_SB04	0.65	None	0.4- 1.3

Six existing groundwater monitoring wells were additionally sampled as part of the ESA. A further three groundwater monitoring wells located on the boundary with the current ash repository, MG\_X\_4/D9, MG\_X\_4/D1 and MG\_X\_4/D10 are considered in this assessment. A surface water sample (MH\_SS01) was collected from a pond located to the south of the coal washery ponds.



Groundwater parameter readings collected during the groundwater sampling works are presented in *Table 3 of Annex B*. Field parameters were generally within the expected range, with the exception of pH. pH was slightly acidic to neutral (5.32 to 6.91) in most locations, with the exception of MH\_X\_D15 which had an acidic pH of 4.24. The groundwater from MH\_X\_D15 is likely influenced by (or potentially representative of) water quality conditions in the up-gradient mine goaf areas adjacent to the west.

Electrical conductivity measurements indicated that groundwater conditions were saline in wells north of, and down-gradient of, the coal washery ponds. Corresponding sodium and chloride concentrations were higher in these wells than upgradient wells (MH\_MW02, MH\_X\_D17, MH\_X\_D18) which also reported EC readings indicative of fresh water.

Evidence of hydrocarbon impact was observed in two wells in this AEC. A sheen was reported at MH\_X\_D15 after purging 3 L, and a strong hydrocarbon odour was noted at MH\_X\_D18 during purging.

#### *Soil Analytical Results*

The soil analytical results have been compared to the adopted human health and ecological screening values as presented in *Table 5.h of Annex B*. Exceedences of the adopted screening values are also graphically presented in *Figure 7 of Annex A*.

Measured concentrations of COPCs were below the adopted human health and ecological screening values in all soil samples collected from within this AEC. Hydrocarbon (TRH and PAH) compounds were detected above the laboratory LOR at a depth of 0.2 m bgl, 8 m bgl and 26 m bgl at MH\_MW01, a depth of at 12 m bgl at MH\_MW02, at a depth of 0.1 m bgl at MH\_SB04, and in a surface sample collected from the coal washery ponds (MH\_SS02). Concentrations of TRH and PAH compounds in all samples in this AEC were below the adopted screening values.

Measured concentrations of various heavy metals were above the corresponding laboratory LOR in a number of soil samples collected from within this AEC however all concentrations were below the adopted screening values.

#### *Groundwater Analytical Results*

Groundwater analytical results compared to the adopted screening values are presented in *Table 5.h of Annex B*. Exceedences of the adopted screening values are also graphically presented in *Figure 8.1 to 8.9 of Annex A*.

Measured concentrations of the majority of the COPCs were below the adopted screening values in all groundwater samples analysed. The exceptions to this were some detections of metals within groundwater across this AEC. The measured concentrations of metals were below the adopted screening values in the surface water sample collected from MH\_SS01.

The majority of measured concentrations were below or close to the corresponding laboratory LOR. Concentrations of TRH C<sub>16</sub>-C<sub>34</sub> and TRH C<sub>34</sub>-C<sub>40</sub> were above the corresponding laboratory LORs in groundwater at MH\_X\_D18; however all concentrations were below the adopted screening values. Monitoring well MH\_X\_D18 is located down-gradient of the coal washery ponds, and is screened at a depth of 37.5 - 43.5 m bgl in shale bedrock.

Arsenic, boron, cadmium, chromium, copper, lead, manganese, nickel, zinc were detected in groundwater at concentrations in excess of the ecological screening values. Arsenic, lead, manganese and nickel were detected in groundwater at concentrations in excess of the human health (drinking water) screening values. Manganese and nickel were detected in groundwater at concentrations in excess of the human health (recreational assessment) criteria.

#### *Discussion*

No exceedences of the adopted ecological or human health screening values were identified in soil samples collected from within this AEC. The detection of TRH and PAH in soil and groundwater is likely associated with the presence of coal in the mine overburden used to backfill these areas.

All seven of the groundwater monitoring wells reported metals concentrations greater than the adopted human health and/or ecological screening values. Metals exceeding the adopted ecological screening values included arsenic, boron, cadmium, chromium, copper, lead, manganese, nickel, zinc. Arsenic, lead, manganese and nickel were detected in groundwater at concentrations in excess of the human health (drinking water) screening values. Manganese and nickel were detected in groundwater at concentrations in excess of the human health (recreational assessment) criteria.

As metals have been identified at concentrations exceeding the adopted screening criteria in groundwater within all AECs a consolidated discussion of this issue is presented in *Section 5.5* including consideration of groundwater salinity.

5.4.9

**MI - Water Holding Ponds**

*Background*

Open ponds used to store and treat wastewaters are located within the central portion of the operational area. These are lined with HDPE to reduce the potential for wastewater loss, and monitoring bores are located near the ponds to facilitate detection of potential leakages.

During the PESA (ERM, 2013a), site management reported that monitoring results indicate that leakage has not occurred.

While routine groundwater monitoring has been undertaken in this area, further investigation was considered to be required to provide a baseline for soil and groundwater conditions in this area.

*AEC Methodology and Investigation Field Observations*

A total of seven soil investigation bores were drilled within this AEC. Based on the presence of existing monitoring wells, and a relatively low risk of contamination, additional groundwater monitoring wells were not deemed necessary. However, as no soil was data available for existing monitoring wells within this area, four investigation points were located in proximity to existing monitoring wells. Remaining boreholes were distributed to provide coverage of the area. The sampling locations within this AEC are presented on *Figures 5.3 and 5.5 of Annex A*. Relevant borehole logs are presented within *Annex D*.

No field indicators of contamination, such as staining, odours or visibly stressed vegetation were noted within this AEC. No staining or unusual odours were detected at any depth through the sampled soil profile. Measured concentrations of ionisable volatile compounds via headspace analysis were noted not to exceed 0.6 ppm v (isobutylene equivalent) in any soil sample collected from this AEC.

A summary of the field observations from the drilling works are presented *within Table 5.12*.

**Table 5.12** *Field Observations Summary - AEC MI*

Borehole ID	Depth (m bgl)	Visual or Olfactory Evidence	PID Range (ppm)
MI_SB02	0.8	None	0.1-0.4
MI_SB03	3	None	0-0.4
MI_SB04	3	None	0.1
MI_SB05	0.8	None	0.3-0.6
MI_SB06	1.3	None	0-0.1
MI_SB07	0.8	None	n/a <sup>^</sup>
MI_SB08	0.6	None	n/a <sup>^</sup>

<sup>^</sup> refusal encountered. Insufficient sample for duplicate to measure with PID due to coarse fill material (gravels and cobbles).

Groundwater field parameter readings collected during the groundwater sampling works are presented in *Table 3 of Annex B*. Field parameters were generally within the expected range in this AEC. Electrical conductivity readings indicated fresh water conditions.

No indications of contamination, such as sheen or odours, were observed during groundwater sampling within this AEC. A summary of field observations from the groundwater sampling works are presented within *Table 3 of Annex B*.

#### *Soil Analytical Results*

The soil analytical results have been compared to the adopted human health and ecological screening values as presented in *Table 4.i of Annex B*.

Measured concentrations of COPCs were below the adopted screening values in all soil samples collected from within this AEC. The majority of measured concentrations were below or close to the corresponding laboratory LOR, with the exception of TRH C<sub>10</sub>-C<sub>16</sub> and TRH C<sub>16</sub>-C<sub>34</sub> and total PAH. Concentrations of TRH C<sub>10</sub>-C<sub>16</sub> and TRH C<sub>16</sub>-C<sub>34</sub> were above the corresponding laboratory LOR in soil collected from 0.2 m bgl at MI\_SB04, however all concentrations were below the adopted screening values. Concentrations of total PAHs were above the corresponding laboratory LOR in soil collected from 0.2 m bgl at MI\_SB04 and at 0.2 m bgl at MI\_SB06 however all concentrations were below the adopted screening values.

Measured concentrations of various heavy metals were above the corresponding laboratory LOR in a number of soil samples collected from within this AEC however all concentrations were below the adopted screening values.

#### *Groundwater Analytical Results*

Groundwater analytical results compared to the adopted screening values are presented in *Table 4.i of Annex B*. Exceedences of the adopted screening values are also graphically presented in *Figure 8.1 to 8.9 of Annex A*.

Measured concentrations of the majority of the COPCs were below the laboratory LOR in all groundwater samples analysed. The exceptions to this were some detections of metals within groundwater across this AEC.

Cadmium, copper, manganese, nickel and zinc were detected at concentrations in excess of the adopted ecological in groundwater samples collected from all groundwater monitoring wells within this AEC. Manganese and nickel were detected at concentrations in excess of the adopted human health (drinking water and recreational) in groundwater samples collected from several groundwater monitoring wells within this AEC.

*Discussion*

No exceedences of the adopted ecological or human health screening values were identified in soil samples collected from within this AEC.

All four of the groundwater monitoring wells reported metals concentrations greater than the adopted human health and ecological screening values. Metals exceeding the adopted ecological screening values included cadmium, copper, manganese, nickel and zinc. Manganese and nickel concentrations in excess of the adopted human health (drinking water and recreational) screening values were also reported in a number of samples.

As metals have been identified at concentrations exceeding the adopted screening criteria in groundwater within all AECs a consolidated discussion of this issue is presented in *Section 5.5*.

**5.4.10 MJ - Operational USTs***Background*

Four underground storage tanks (USTs) are present on site, containing diesel and petrol (E10), in the stores area, diesel generator and the mobile plant area. The USTs are understood to be approximately 20 years old and no information was available on their construction. Site management advised that tank integrity tests are undertaken routinely at the site and have not identified any issues. The USTs are located as follows:

- Petrol and diesel USTs near the main store (approx. 33 000L and 20 000L respectively);
- Diesel UST for the emergency generator (11 700L) and associated above ground day tank; and
- Diesel USTs at the mobile plant refuelling area (see *Section 5.4.5*).

Soil and groundwater investigations have been completed in the areas of underground tank infrastructure to ensure compliance with relevant underground petroleum storage system (UPSS) legislation.

Soil and groundwater investigations to date have been conducted around the underground fuel infrastructure, and did not include laboratory analysis of soils. Therefore further investigation was considered to be required to provide a baseline for soil and groundwater conditions in this area.

*AEC Methodology and Investigation Field Observations*

Six existing monitoring wells were sampled within this AEC. A total of three soil investigation bores, one of which was completed as a groundwater monitoring well, were advanced within this AEC. This AEC falls within the operational area, and also overlaps with Area MD (Workshops), these

investigation locations are therefore also discussed in the sections relevant to those AECs. Soil bores and monitoring wells were distributed around the perimeter of the AEC as presented in *Figure 5.3 of Annex A*. Relevant borehole logs are presented within *Annex D*.

Several proposed soil bores in Area MK adjacent to the diesel generator grid based locations were abandoned due to site infrastructure and the likely presence of underground services.

Monitoring well MK\_MW09 (MK\_SB42) was located presumed upgradient of the diesel UST. Soil bore MK\_SB24 was located adjacent to existing monitoring well MJ\_X\_MWMP1 to assess soil conditions adjacent to the petrol UST. Soil bore MD\_MW02 and monitoring well MD\_MW01 were located cross-gradient of existing wells around the petrol USTs.

No field indicators of contamination, such as staining, odours or visibly stressed vegetation were noted within this AEC. No staining or unusual odours were detected at any depth through the sampled soil profile. Measured concentrations of ionisable volatile compounds via headspace analysis were noted not to exceed 0.6 ppm v (isobutylene equivalent) in any soil sample collected from this AEC.

A summary of the field observations from the drilling works are presented within *Table 5.13*.

**Table 5.13** *Field Observations Summary - AEC MJ*

Borehole ID	Depth (m bgl)	Visual or Olfactory Evidence	PID Range (ppm)
MK_SB42	6	None	0.1-1.2
MK_SB24	3	None	0.2-1.7
MD_MW01	7	None	0- 0.6
MD_MW02	1.8	None	1.6-1.8

Groundwater field parameter readings collected during the groundwater sampling works are presented in *Table 3 of Annex B*. Field parameters were generally within the expected range in this AEC. Electrical conductivity readings indicated fresh water conditions.

No indications of contamination, such as sheen or odours, were observed during groundwater sampling within this AEC. A summary of field observations from the groundwater sampling works are presented within *Table 3 of Annex B*.

*Soil Analytical Results*

The soil analytical results have been compared to the adopted human health and ecological screening values as presented in *Table 4j of Annex B*.

Measured concentrations of COPCs were below the adopted screening values in all soil samples collected from within this AEC.

The majority of measured concentrations were below or close to the corresponding laboratory LOR, with the exception of TRH C<sub>10</sub>-C<sub>16</sub> and TRH C<sub>16</sub>-C<sub>34</sub> and total PAH. Concentrations of TRH C<sub>10</sub>-C<sub>16</sub> and TRH C<sub>16</sub>-C<sub>34</sub> were above the corresponding laboratory LOR in soil collected from 2.0 m bgl at MD\_MW04, however all concentrations were below the adopted screening values. Concentrations of total PAHs were above the corresponding laboratory LOR in soil collected from 2.0 m bgl at MD\_MW04 and at .04 m bgl at MK\_SB42 however all concentrations were below the adopted screening values.

Measured concentrations of various heavy metals were above the corresponding laboratory LOR in a number of soil samples collected from within this AEC however all concentrations were below the adopted screening values.

#### *Groundwater Analytical Results*

Groundwater analytical results compared to the adopted screening values are presented in *Table 5j of Annex B*. Exceedences of the adopted screening values are also graphically presented in *Figure 8.1 to 8.9 of Annex A*

Measured concentrations of the majority of the COPCs were below the laboratory LOR in all groundwater samples analysed, with the exception of metals, BTEX and TRH in groundwater. Concentrations of some TRH fractions were above the corresponding laboratory LOR in groundwater from monitoring well MJ\_X\_MWMP1 and MK\_MW09, however all concentrations were below the adopted screening values.

The concentration of benzene in groundwater at MJ\_X\_MWMP1 was in excess of the human health (drinking water) screening values.

Arsenic, copper, manganese, nickel and zinc were detected at concentrations in excess of the adopted ecological screening values in groundwater samples collected from all groundwater monitoring wells within this AEC. Manganese and nickel were detected at concentrations in excess of the adopted human health (drinking water) screening values in groundwater samples collected from several groundwater monitoring wells within this AEC.

#### *Discussion*

No exceedences of the adopted ecological or human health screening values were identified in soil samples collected from within this AEC.

Groundwater from most monitoring wells within this AEC reported metals concentrations greater than the adopted ecological screening values.

Metals exceeding the adopted ecological screening values included arsenic, copper, manganese, nickel and zinc. Magnesium and nickel concentrations in excess of the adopted human health (drinking water) screening values were also reported in a number of samples.

Benzene was detected at concentrations in excess of the adopted human health (drinking water) screening values in groundwater at MJ\_X\_MWMP1 adjacent to a UST and fuel bowsers. The benzene exceedence at this location is attributable to the UST and associated fuel lines or possible surface spills. It is recommended that the integrity of the UST and lines in this location be tested to assess the potential for sub-surface leaks. As groundwater in the vicinity of the Site is not extracted for drinking water, the presence of benzene in excess of the adopted human health (drinking water) screening values is not considered to represent a significant risk to humans under the ongoing use of the Site as a power station.

As metals have been identified at concentrations exceeding the adopted screening criteria in groundwater within all AECs a consolidated discussion of this issue is presented in *Section 5.5*.

#### **5.4.11 MK - Accessible Operational Areas**

##### *Background*

The main operational area of the Site was constructed on former open cut coal mine workings. Historical maps of the Site indicating the approximate location of former open cut mines and underground workings are provided in PPK (2000), and are represented in *Figure 4, Annex A*. The former open cut workings were reportedly filled with mine overburden and mine wastes. Although there are no available records of the material used for backfill, borelogs from installations of monitoring wells, and from previous investigations (PB, 2012) corroborate the use of mine overburden as backfill. Along with mine overburden, it is feasible that other smaller waste streams used as backfill may be contributing to elevated salt, metals and acidity in groundwater.

It is also feasible that isolated areas of contamination relating to previous mine operation may remain at the facility. Historical activities with the potential to cause isolated contamination issues include maintenance, chemical storage and refuelling. Targeted activities within the operational area include transformers (Area MC), fuel tanks (Area ME and MF) and workshops (Area MD).

Given the history of mining operations, and power station operations, and the lack of existing investigation data for this AEC, the PESA considered further investigation to be required to provide a baseline and to assess the potential for soil and groundwater contamination.



*AEC Methodology and Investigation Field Observations*

Seventy-three soil investigation bores were advanced across the operational area in a general grid pattern. Areas with high electrical hazards (i.e electrical transformers) and key operational areas of the plant (including the cooling towers) were excluded from the intrusive works, with sampling locations distributed around the perimeter of these areas. Several proposed grid based locations were abandoned due to physical access restraints from site infrastructure, the presence of underground services and areas where underground services were suspected and could not be confirmed. Several soil bores were terminated before the target depth of 3 m due to refusal on fill material (typically mine overburden). Nine soil bores were advanced beyond 3m and completed as groundwater monitoring wells to provide a general coverage of groundwater conditions within this area. The sampling locations within this AEC are presented on *Figures 5.3 and 5.4 of Annex A*. Relevant borehole logs are presented within *Annex D*.

Field indicators of contamination, such as staining, odours or visibly stressed vegetation were not typically noted within this AEC. The exception to this was an odour from 0.8-1.2m bgl within fill material at location MK\_SB87, with no staining was evident at this location. No staining or unusual odours were detected at any depth through the sampled soil profile at other locations within this AEC. Measured concentrations of ionisable volatile compounds via headspace analysis did not generally exceed 4 ppm v (isobutylene equivalent) in soil samples collected from this AEC. The highest concentration of ionisable volatile compounds was measured at a depth of 1.4, bgl at MK\_SB87 at 262.6 ppm v, associated with an odour detected at 0.8-1.6 m bgl.

A summary of the field observations from the drilling works are presented within *Table 5.14*.

**Table 5.14** *Field Observations Summary - AEC MK*

Borehole ID	Depth (m bgl)	Visual or Olfactory Evidence	PID Range (ppm v )
MK_SB01	0.25	None	0-0.6
MK_SB02	2.35	None	0.2- 1.6
MK_SB03	1.1	None	0.3-0.6
MK_SB04	3	None	0.3-1.0
MK_SB05	1.5	None	0.1-0.5
MK_SB06	0.55	None	0-0.1
MK_SB07	1.6	None	0-0.6
MK_SB08	0.9	None	0.3-0.9
MK_SB09	1.25	None	0-0.5
MK_SB10	1.8	None	0-0.3
MK_SB11	1.7	None	0-0.5
MK_SB12	0.95	None	0-0.3
MK_SB13	1.6	None	0.3-1.1
MK_SB14	3	None	0-0.4
MK_SB15	1.2	None	0.1-0.4
MK_SB16	8.7	None	0.1-0.5
MK_SB17	1.7	None	0.1-0.3

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Borehole ID	Depth (m bgl)	Visual or Olfactory Evidence	PID Range (ppm v )
MK_SB18	0.5	None	0-0.1
MK_SB19	0.7	None	0
MK_SB20	0.4	None	0
MK_SB22	7	None	0.1-3.5
MK_SB24	3	None	0.2-1.7
MK_SB25	22.6	None	0-0.1
MK_SB26	0.4	None	0
MK_SB27	0.55	None	0-1.9
MK_SB28	3	None	0-1.3
MK_SB30	3	None	0.1-0.5
MK_SB31	0.2	None	0-0.3
MK_SB32	0.5	None	0-0.3
MK_SB33	1.8	None	0.7-2.4
MK_SB34	3.9	None	0.2-2.8
MK_SB35	3.9	None	0.3-0.9
MK_SB36	0.5	None	0.5-0.7
MK_SB37	1.45	None	0.2-0.3
MK_SB38	3.8	None	0.1-3.9
MK_SB39	6	None	0.1-2.7
MK_SB40	3	None	0-3
MK_SB42	6	None	0.1-1.2
MK_SB43	1.7	None	0.1-1
MK_SB44	3	None	0-0.3
MK_SB45	0.1	None	0-0.3
MK_SB46	2.1	None	1.7-2
MK_SB47	3	None	0.7-2.2
MK_SB49	1.2	None	0-0.1
MK_SB50	0.45	None	0.1-0.2
MK_SB51	5	None	0.4-3.8
MK_SB52	0.65	None	0-0.1
MK_SB54	1.1	None	1.-2.4
MK_SB55	0.6	None	0-0.2
MK_SB56	0.9	None	0.1-0.2
MK_SB57	3.9	None	0-3.1
MK_SB58	3.9	None	0.3-2.2
MK_SB59	0.75	None	0-0.1
MK_SB61	0.55	None	0.2-0.3
MK_SB62	1.3	None	0.1-0.2
MK_SB63	0.1	None	0-1
MK_SB64	0.1	None	0-0.5
MK_SB65	5	None	0.1-0.6
MK_SB66	0.1	None	0-0.3
MK_SB67	0.1	None	0
MK_SB68	6.8	None	0-3.7
MK_SB69	0.1	None	0-0.9
MK_SB71	3	None	0.1-1.1
MK_SB72	1	None	0.1-0.3
MK_SB75	0.1	None	0-0.3
MK_SB76	5	None	0.2-3.3
MK_SB78	6.3	None	0.1-0.7
MK_SB79	3	None	0.1-0.9
MK_SB81	3.9	None	0.2-1.1
MK_SB82	3.9	None	0.1-1.6
MK_SB84	1.5	None	0-0.1
MK_SB86	3.9	None	0.3-2.3
MK_SB87	7	Odour at 0.8-1.6 m	0.2-262.6

Groundwater field parameter readings collected during the groundwater sampling works are presented in *Table 3 of Annex B*. Field parameters were generally within the expected range in this AEC. Electrical conductivity readings indicated fresh water conditions.

No indications of contamination, such as sheen or odours, were observed during groundwater sampling within this AEC. A summary of field observations from the groundwater sampling works are presented within *Table 3 of Annex B*.

#### *Soil Analytical Results*

The soil analytical results have been compared to the adopted human health and ecological screening values as presented in *Table 4k of Annex B*.

Measured concentrations of all COPCs with the exception of TRH C<sub>10</sub>-C<sub>16</sub> and TRH C<sub>16</sub>-C<sub>34</sub> (discussed below) were below the adopted screening values in all soil samples collected from within this AEC. The majority of measured concentrations were below or close to the corresponding laboratory LOR.

Concentrations of some TRH fractions were above the corresponding laboratory LOR in soil collected from 0.2 m bgl at MK\_SB62, 0.4 m bgl at MW\_SB61, 1.0 m bgl at MK\_SB35 and 1.0 m bgl at MK\_SB87. All concentrations were below the adopted screening values with the exception of TRH C<sub>10</sub>-C<sub>16</sub> which exceeded the adopted ESLs at 1.0 m bgl at MK\_SB87. Concentrations of xylene were above the corresponding laboratory LOR in soil collected from 3.9 m at MK\_SB78 and 1.0 m bgl at MK\_SB87, however all concentrations were below the adopted screening values.

Concentrations of various heavy metals were identified above the corresponding laboratory LOR in a number of soil samples collected from within this AEC. All concentrations were below the adopted screening values, with the exception of copper in a sample collected from 1.5 m bgl at MK\_SB33 which exceeded the adopted EIL.

#### *Groundwater Analytical Results*

Groundwater analytical results compared to the adopted screening values are presented in *Table 4k of Annex B*. Exceedences of the adopted screening values are also graphically presented in *Figure 8.1 to 8.9 of Annex A*.

Measured concentrations of the majority of the COPCs were below the laboratory LOR in all groundwater samples analysed, with the exception of metals, PAH and TRH in groundwater. Concentrations of some TRH fractions were above the corresponding laboratory LOR in groundwater from monitoring well MK\_MW05 and MK\_MW09, however all concentrations were below the adopted screening values.

Concentrations of some PAHs were above the corresponding laboratory LOR in groundwater from monitoring well MK\_MW05, however all concentrations were below the adopted screening values.

Arsenic, cadmium, copper, lead, manganese, nickel and zinc were detected at concentrations in excess of the adopted ecological screening values in groundwater samples collected from several groundwater monitoring wells within this AEC. Manganese and nickel were detected at concentrations in excess of the adopted human health (drinking water and recreational) screening values in groundwater samples collected from several groundwater monitoring wells within this AEC. The adopted human health (drinking water) screening values were also exceeded for arsenic at MK\_MW06 and lead at MK\_MW07.

#### *Discussion*

No exceedences of the adopted human health screening values were identified in soil samples collected from within this AEC. The ecological screening values were exceeded at MK\_SB86 and MK\_SB33.

The measured concentration of TRH C<sub>10</sub>-C<sub>16</sub> exceeded the adopted ESLs at 1.0 m bgl at MK\_SB87, located on the western side of the main plant, behind Unit 2. Operational activities in this area include a washdown pit and day maintenance building. The concentration of TRH in soil was below the adopted human health screening values, TRH was not detected above the laboratory LOR in groundwater at this location (MK\_MW04). It was noted that vegetation in this area is limited to grass on landscaped areas. Grasses have a shallow root zone and impacts at a depth of 1.0 m bgl are therefore considered unlikely to represent a significant risk to the terrestrial environment under the ongoing use of the Site as a power station.

Copper concentrations marginally exceeded ecological criteria in shallow soil sampled from 1.5 m bgl at MK\_SB33. It is noted that the concentration of copper in the shallower sample at 1.0 m bgl at this location was below the adopted ecological criteria, with a concentration of 6 mg/kg which was marginally above the laboratory LOR of 5 mg/kg. This exceedence is likely attributed to the presence of fill materials sourced from mine overburden which is ubiquitous across the Site but heterogeneous in composition.

The copper concentrations in soils from 1.5 m bgl in Area MK were all <250% of the ecological screening criteria and the 95% UCL of the mean concentration was less than the adopted EIL. It is also noted that the standard deviation of these samples was less than 50% of the adopted EIL (refer to *Annex I* for details of all relevant calculations). These impacts are therefore considered unlikely to represent a significant risk to the terrestrial environment under the ongoing use of the Site as a power station.

Groundwater from all monitoring wells within this AEC reported metals concentrations greater than the adopted ecological screening values. Metals exceeding the adopted ecological screening values included arsenic, cadmium, copper, lead, manganese, nickel and zinc. Arsenic and lead, concentrations in excess of the adopted human health (drinking water) screening values and nickel concentrations in excess of the adopted human health (drinking water and recreational) screening values were also reported in a number of samples.

As metals have been identified at concentrations exceeding the adopted screening criteria in groundwater within all AECs a consolidated discussion of this issue is presented in *Section 5.5*.

#### **5.4.12 *ML - Non Operational Areas (including Buffer Lands & Former Contractors Yard)***

##### *Background*

This AEC includes buffer lands outside of the fence operational area of the main Site which are largely un-used. Current infrastructure in these areas includes a Trans-grid substation and overhead transmission lines. There are three former landfills located in the buffer lands, which are addressed in AEC MA (*Section 5.4.1*). The buffer lands include areas which have been extensively mined. This includes underground mine workings and former open cut mines which have been partly or fully backfilled with mine overburden. The location and extent of former mine workings on- and off-site are illustrated in *Figure 4, Annex A*. Connell Wagner (2008) reported that groundwater associated with the underground mine goaf<sup>1</sup> has been characterised by elevated concentrations of sulfate, the metalloid boron, and the metals manganese, nickel and zinc.

The buffer lands are characterised by steep terrain with dense vegetation, and access to these areas was limited to areas immediately adjacent to roads and tracks. Former mine infrastructure may be present in inaccessible parts of the buffer lands. This includes structures which appear to be water treatment dams to the north of the Site. Interviews with site staff indicated that these areas are largely un-used, aside from access to transmission lines and substations.

During construction of the power station, temporary contractors yards were established around the perimeter of the current operational area. Infrastructure associated with these areas likely included site sheds, workshops, machinery and parts maintenance, fuel and chemical storage and septic tanks.

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<sup>1</sup> The goaf areas are the underground mine areas where coal pillars have been partially mined and the roof allowed to collapse.

Given the absence of previous environmental characterisation work, the PESA (ERM, 2013a) recommended that a broad-scale assessment of potential contamination be undertaken to provide a baseline and to assess the potential for soil and groundwater contamination within this AEC.

The former contractors yards to the north and east of the operational were assessed in *Section 5.4.11* (MK - Operational Areas) and *Section 5.4.6* (MF - Operational ASTs). The former contractors yards to the west of the operational area are outside of the boundary of the Site.

#### *AEC Methodology and Investigation Field Observations*

Seven soil bores were advanced within the formers contractors' yard; two of which were completed as groundwater monitoring wells. The contactors yard is situated on a hill approximately 20 m above the operational area and shale and coal was observed to outcrop at the surface. Due to the presence of shallow bedrock, surface soil was subsequently sampled at an additional 16 locations to provide an assessment of potential soil contamination within this area.

A total of seven soil investigation bores were advanced within the buffer areas of the site, and six completed as groundwater monitoring wells. One surface soil sample was additionally collected within the buffer area.

For the purpose of discussion of groundwater results, monitoring wells from Area MG and MA have been included where they are located within the buffer lands. The sampling locations within this AEC are presented on *Figures 5.1, 5.2 and 5.4* of *Annex A*. Relevant borehole logs are presented within *Annex D*.

No field indicators of contamination, such as staining, odours or visibly stressed vegetation were noted within this AEC. No staining or unusual odours were detected at any depth through the sampled soil profile. Measured concentrations of ionisable volatile compounds via headspace analysis were noted not to exceed 3.3 ppm v (isobutylene equivalent) in any soil sample collected from this AEC.

A summary of the field observations from the drilling works are presented within *Table 5.15*.

Table 5.15 Field Observations Summary – AEC ML

Borehole ID	Depth (m bgl)	Visual or Olfactory Evidence	PID Range (ppm)
ML_MW02	0.6	None	0- 0.1
ML_MW03	24.5	None	n/a^
ML_MW05	18.1	None	0-0.2
ML_MW07	5.0	None	0.2-1.8
ML_MW10	16.0	None	1.3-1.8
ML_MW12	8.0	None	0-0.7
ML_MW14	0.2	None	0-0.2
ML_MW15	15.9	None	0-1.9
ML_MW17	0.4	None	n/a^
ML_MW18	0.75	None	n/a^
ML_MW19	0.25	None	n/a^
ML_MW20	24.0	None	n/a^
ML_MW21	30.0	None	n/a^
ML_SB22	0.1	None	0-1.1
ML_MW23	0.3	None	n/a^
ML_MW24	0.45	None	0.0
ML_SB25	0.1	None	0.0
ML_SB26	0.1	None	0.0
ML_SB27	0.1	None	0.0
ML_SB28	0.1	None	0.0
ML_SB29	0.15	None	0.0
ML_SB30	0.15	None	0.0
ML_SB31	0.15	None	0.6
ML_SB32	0.1	None	0.1
ML_SB34	0.1	None	3.3
ML_SB35	0.15	None	0.0
ML_SB36	0.1	Red sand	0.0
ML_SB37	0.1	None	0.0
ML_SB38	0.1	None	n/a^
ML_SB39	0.15	None	0.0
ML_SB40	0.15	None	0.0

^Insufficient sample for duplicate to measure with PID due to coarse fill material (gravels and cobbles) and/or refusal on bedrock.

Groundwater field parameter readings collected during the groundwater sampling works are presented in Table 3 of Annex B. Field parameters were generally within the expected range in this AEC. Electrical conductivity measurements indicated fresh water conditions in most locations, with the exception of ML\_MW05 which indicated saline conditions. The saline conditions at ML\_MW05 may be influenced by or potentially indicative of water quality in mine goaf areas located to the east. The measured pH was slightly acidic in most locations, with the exception of MG\_X\_4/D4 which had an acidic pH of 3.31. The acidic conditions at MG\_X\_4/D4 are likely related to the presence of mine spoil indicated on historical drawings. Borelogs for existing well MG\_X\_4/D4 also indicate this well is screened in mine overburden.

No indications of contamination, such as sheen or odours, were observed during groundwater sampling within this AEC. A summary of field observations from the groundwater sampling works are presented within Table 3 of Annex B.

*Soil Analytical Results*

The soil analytical results have been compared to the adopted human health and ecological screening values as presented in *Table 4.1 of Annex B*.

Measured concentrations of COPCs were below the adopted screening values in the soil samples collected from within this AEC. The majority of measured concentrations were below or close to the corresponding laboratory LOR.

Measured concentrations of various heavy metals were above the corresponding laboratory LOR in a number of soil samples collected from within this AEC. All concentrations were below the adopted screening values, with the exception of copper, nickel and zinc in samples collected at 0.05 m bgl at ML\_SB36 which exceeded the adopted EIL.

*Groundwater Analytical Results*

Groundwater analytical results compared to the adopted screening values are presented in *Table 4.1 of Annex B*. Exceedences of the adopted screening values are also graphically presented in *Figure 8.1 to 8.9 of Annex A*.

Measured concentrations of the majority of the COPCs were below the laboratory LOR in all groundwater samples analysed. The exceptions to this were some detections of metals within groundwater across this AEC, and PAHs, TRH at MK\_MW05. Concentrations of PAHs and some TRH fractions were above the corresponding laboratory LOR in groundwater from monitoring well MK\_MW05, downgradient of the former contractors yard, however all concentrations were below the adopted screening values. Groundwater at MK\_MW05 was encountered within shale with interbedded coal and the detection of TRH and PAH in this location can be attributed to the background concentrations of hydrocarbons present in coal. Arsenic, cadmium, copper, lead, manganese, nickel and zinc were detected at concentrations in excess of the adopted ecological screening values in groundwater samples collected from all groundwater monitoring wells within this AEC. At MG\_X\_4/D4 the measured concentration of chromium also exceeded the adopted ecological screening values. Arsenic, lead, manganese and nickel were detected at concentrations in excess of the adopted human health (drinking water) screening values in groundwater samples collected from several groundwater monitoring wells within this AEC. At MG\_X\_4/D4 the measured concentration of cadmium also exceeded the adopted human health (drinking water) screening values. Arsenic in groundwater at MG\_X\_4/D4 and manganese in groundwater from several groundwater monitoring wells within this AEC was detected at concentrations in excess of the human health (recreational) screening values.



*Discussion*

No exceedences of the adopted human health screening values were identified in soil samples collected from within this AEC. Copper, nickel and zinc concentrations exceeded ecological criteria in shallow soil sampled from 0.05 m bgl at ML\_SB36.

The copper and nickel concentrations at ML\_SB36 were >250% of the ecological screening criteria. Red sand was present at the surface at ML\_SB36, extending from a nearby workshop building and covering an area of approximately 100 m<sup>2</sup>. This sand is likely a product of grit blasting on open ground from historical operations relating to Site construction activities.

Shale bedrock outcrops were observed at the surface in this area, with shallow soils typically less than 0.5 m bgl in this area. Photographs of the ground conditions in this AEC are presented in *Annex G*. There is limited soil to support plant growth, and it is unlikely to represent an area of high ecological significance. These impacts are considered unlikely to represent a significant risk to the terrestrial environment under the ongoing use of the Site as a Power Station.

All groundwater monitoring wells reported metals concentrations greater than the adopted ecological screening values. Metals exceeding the adopted ecological screening values included arsenic, cadmium, chromium, copper, lead, manganese, nickel and zinc. Arsenic, lead, manganese and nickel concentrations in excess of the adopted human health (drinking water) screening values were also reported in a number of samples. Manganese concentrations also exceeded the adopted human health (recreational) screening values in groundwater from several groundwater monitoring wells.

At MG\_X\_4/D4 the measured concentration of cadmium also exceeded the adopted human health (drinking water) screening values, and arsenic concentrations in groundwater at MG\_X\_4/D4 also exceeded the human health (recreational) screening values.

As metals have been identified at concentrations exceeding the adopted screening criteria in groundwater within all AECs a consolidated discussion of this issue is presented in *Section 5.5*.

#### **5.4.13 MM - Water Assets (Lake Lyell and Thompsons Creek Reservoir)**

*Background*

The Coxs River was dammed downstream of Lake Wallace to form Lake Lyell in 1982. Lake Lyell has an active capacity of approximately 31 GL, sourced from local runoff. The water is also pumped to off-stream storage at Thompsons Creek, which supplies Mt Piper, or to Lake Wallace, which supplies Wallerawang Power Station.

There are currently three local farmers with agreements to agist stock within the buffer lands around Lake Lyell. Lithgow City Council owns a portion of lands adjacent to Lake Lyell, as well as leasing additional lands which are publicly accessible for camping and recreation.

Thompsons Creek Reservoir is located approximately 8 km south-west of the operational area of Mt Piper Power Station. The reservoir was constructed in 1992 on Thompsons Creek to provide off-stream storage for supply of the water to Mt Piper and Wallerawang. Although the surface runoff catchment of Thompson Creek is relatively small, Thompsons Creek Reservoir has a storage capacity of up to 27.5 GL with water routinely pumped from Lake Lyell.

The reservoir is also available to the public for recreational fishing. Surrounding buffer lands are generally vacant vegetated lands, with some areas used for stock grazing by local farmers under agreements with Delta.

The Coxs River catchment includes several current and historical coal mine operations, the Mt Piper Power Station and Wallerawang Power Station, and is highly disturbed. The Coxs River runs from north to south, and is dammed at Lake Wallace and Lake Lyell to provide water supply for the Delta Electricity Power Stations and other uses.

The PESA (ERM, 2013) noted that selenium monitoring had been conducted in Lake Lyell. However, given the numerous potential sources of contaminants and the presence of recreational users of Lake Lyell, further investigation was considered warranted to provide a baseline assessment of conditions for this area.

The PESA (ERM, 2013) noted that there had been no surface water or sediment investigations undertaken at Thompsons Creek Reservoir, and further investigation was therefore considered warranted to provide a baseline assessment of conditions for this area.

#### *AEC Methodology and Investigation Field Observations*

Samples were collected between 21 November and 22 November, 2013 from a total of 7 sampling locations. Sampling locations were distributed around the AEC as shown in *Figure 5.6 of Annex A*.

Sediment and surface water field notes are presented in *Annex E*. A summary of the field parameters recorded during the surface water sampling is presented in *Table 5m of Annex B*.

The depth to sediment in Lake Lyell ranged from approximately 1.0 m to 18.0 m and from approximately 7.5 m to 11.0 m in Thompson Creek Reservoir. Three of the four sediment samples collected in Lake Lyell were clay with trace to some silt.

The fourth consisted of silt with some gravel. Sediments in Thompsons Creek Reservoir were coarser and more variable, with sediments ranging from clay with some silt and gravel to gravel with some silt and clay.

No field indicators of contamination, such as staining, sheen, or odours were noted within this AEC.

#### *Sediment Analytical Results*

The sediments were analysed for grain size, phenols, TRH, BTEX, PAHs, and metals. The sediment analytical results were compared to the ANZECC (2000) ISQG-Low and ISQG-High values. The sediment analytical results compared to the adopted screening values are presented in *Table 4m of Annex B*.

Measured concentrations of COPCs were below the ISQG-High in all sediment samples, however, the concentrations of metals exceeded the ISQG-Low in some samples. The majority of measured concentrations were below or close to the corresponding laboratory LOR, with the exception of metals.

Phenol and BTEX concentrations were less than the laboratory LOR and the adopted screening values in all sediment samples. PAH concentrations were less than the laboratory LOR. However, it is noted that due to the moisture content of the samples the laboratory LOR were greater than the ISQG-Low for some of the PAHs in the analytical suite and, in a smaller subset, greater than the ISQG-High.

Measured concentrations of various heavy metals were above the corresponding laboratory LOR in a number of sediment samples collected from within this AEC. All concentrations were below the adopted screening values in Lake Lyell, with the exception of copper, nickel and zinc concentrations at one location, MM\_SS21, which exceeded the ISQG-Low; however all concentrations were below the ISQG-High. All concentrations were below the adopted screening values in Thompsons Creek Reservoir with the exception of copper and lead concentrations which exceeded the ISQG-Low in one location, MM\_SS40; however all concentrations were below the ISQG-High.

For the purposes of this assessment, and given the small data set, the ISQG values have not been normalised to 1% TOC, as recommended in ANZECC (2000). The purpose of normalising to 1% TOC is to account for the reductions in bioavailability that can be associated with the presence of organic matter in sediment. As shown in *Table 5m of Annex B*, measured TOC values across the sampling area ranged between 0.7% and 5.44% TOC, with two samples in Thompsons Creek Reservoir having less than 1% TOC.

There were no applicable Australian screening values identified for selenium in sediments. The measured selenium concentrations were however less than the laboratory LOR (5 mg/kg) in all samples collected from Lake Lyell and Thompsons Creek Reservoir.

As there are no current applicable screening values for TRH in sediment in fresh water environments, the screening values for TRH in the Commonwealth of Australia (2009) *National Assessment Guidelines for Dredging* have been adopted for screening purposes. Measured concentrations of TRHC<sub>10-C<sub>36</sub></sub> in Thompsons Creek Reservoir were below the adopted screening value. Measured concentrations of TRHC<sub>10-C<sub>36</sub></sub> in sediments from Lake Lyell were below the adopted screening value, with the exception of the sample collected from MM\_SS21. The concentration of TRHC<sub>10-C<sub>36</sub></sub> at MM\_SS21 marginally exceeded the adopted screening value, with a concentration of 590 mg/kg. It is noted that the adopted screening level is applicable to marine environments, and as such the marginal exceedences of this screening value is not considered to represent a significant issue and is considered unlikely to be attributable to site operations at Mt Piper.

#### *Surface Water Analytical Results*

The surface water samples were analysed for phenols, TRH, BTEX, PAHs, and metals. The surface water analytical results were compared to the adopted ecological and human health (drinking water and recreational) screening values, as discussed in *Section 3.5.2*. The surface water analytical results compared to the adopted screening values are presented in *Table 5m of Annex B*.

Measured concentrations of COPCs were below the adopted screening values in the surface water samples collected from within this AEC, with the exception of metals. The majority of measured concentrations were below or close to the corresponding laboratory LOR. Phenol, BTEX, and PAH concentrations were less than the laboratory LOR and the adopted ecological and human health (drinking water and recreational) screening values in all surface water samples, with the exception of benzo(a)pyrene for which all concentrations were less than the LOR, but the LORs were not always lower than the recreational screening value.

Measured concentrations of various heavy metals were above the corresponding laboratory LOR in a number of surface water samples collected from within this AEC. All concentrations were below the adopted screening values, with the exception of copper and zinc. Copper concentrations exceeded the adopted ecological screening values in all surface water samples from Lake Lyell and Thompsons Creek Reservoir. However, all copper concentrations were below the human health (drinking water and recreational) screening values.

Zinc concentration exceeded the adopted ecological screening values in one sample from Thompsons Creek Reservoir. However, all zinc concentrations were below the human health (drinking water and recreational) screening values.

The mercury concentration was less than the laboratory LOR in all of the surface water samples collected; however, the LOR (0.1 µg/L) was greater than the ecological screening criteria (0.06 µg/L). There was a similar issue for selenium, but a lower laboratory LOR was obtained for a limited number of samples and there were no exceedences of the ecological screening criteria noted among those samples.

#### *Discussion*

##### *Sediment*

As noted in Simpson *et al.* (2005), the ISQG-Low represent concentrations below which the frequency of adverse biological effects is expected to be very low, while the ISQG-High represent concentrations above which adverse biological effects are expected to occur more frequently. If a detected concentration exceeds the relevant ISQG, it does not necessarily mean that adverse biological effects will occur, but rather that more detailed consideration of the results may be required.

The exceedences of the ISQG-Low for copper, nickel, and lead in sediments in Lake Lyell and Thompsons Creek Reservoir are likely representative of background conditions in the respective catchment(s).

The metal concentrations in sediments in Lake Lyell are generally consistent with those reported by Birch *et al.* (1999), with the exception of copper and nickel concentrations measured at MM\_SS21, which were approximately two times the ISQG-Low. It is not possible to determine if the exceedences of the copper, nickel, and zinc ISQG-Low noted in Lake Lyell are due to natural variability in background concentrations or to a localised point source. Other contributing sources to Lake Lyell include the tributary Farmers Creek, which receives inputs from various industries and a sewage treatment plant. Birch *et al.* (1999) also noted metals impacts in sediments in Farmers Creek.

Thompsons Creek Reservoir is located in the headwaters of the catchment, which include surface run-off from grazing lands, and is upgradient of power generation infrastructure. Although water is piped from Lake Lyell, the metal exceedences measured in sediment in the Reservoir are considered likely to be representative of background concentrations in the catchment rather than anthropogenic inputs.

##### *Surface Water*

Given that copper concentrations marginally exceeded the ANZECC (2000) trigger values for the protection of 95% of freshwater species at most locations, it is considered likely that the concentrations are representative of background conditions. The concentration of zinc at MM\_SS40 only marginally exceeded the adopted screening values.

The surface water results do not suggest that there has been significant anthropogenic impact on surface water quality in Lake Lyell or Thompsons Creek Reservoir.

## 5.5 *METAL AND METALLOID CONCENTRATIONS IN GROUNDWATER*

### 5.5.1 *Assessment of Background Conditions*

Metals and metalloids can occur naturally in groundwater, and an assessment of background conditions forms an integral part of the evaluation of metal and metalloid concentrations reported. This is especially relevant where potential off-site sources of metals and metalloids exist, including historical and current underground coal mining works which occur extensively in the vicinity of the Site. Mining activities may alter the hydrological system and intensify surface water and groundwater connectivity. Increased interaction on freshly exposed rock in fractures and fracture zones has the potential to mobilise elements from the rock mass (Jankowski, 2007).

Given that metals concentrations in groundwater exceeded one or more of the adopted human health and/or ecological screening values in most monitoring wells across the Site, the results have also been assessed in the context of background conditions, taking into account results from available background monitoring wells.

The local geology and historical coal mining activities have impacted on the quality of groundwater at the Site. Connell Wagner (2008) reported that groundwater associated with the underground mine goaf<sup>2</sup> (located predominantly to the east of the main operational area of the Power Station and to the south of the current ash repository) has been characterised by elevated concentrations of sulfate, the metalloid boron, and the metals manganese, nickel and zinc. In addition to the former underground and open cut mine workings located on the Site, potential mining related sources of metals and metalloids (including arsenic and boron) include the up-gradient surrounding areas to the south-west and west of the Site. Further potential sources include the coal fines rejects emplaced on the western edge of the Lamberts North ash repository and the current ash repository.

The concentrations of metals in groundwater have been compared to these background wells (as applicable), and for the purposes of this assessment, concentrations equalling or exceeding the maximum background concentrations by a factor of two were considered as potentially indicative of concentrations above background values. Background monitoring wells have been selected from two sets of wells:

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<sup>2</sup> The goaf areas are the underground mine areas where coal pillars have been partially mined and the roof allowed to collapse.

- *Site Background Monitoring Wells* – these wells are located up-hydraulic gradient of all identified on-site sources at the site. These include MA\_MW01, ML\_MW05, ML\_MW10 and ML\_MW12. pH levels and ORP (two key controls on metal and metalloid solubility) in the aforementioned monitoring wells fell within the mid-range of measurements recorded across the monitoring well network at the Site, with pH measurements from the background monitoring wells varying between 6.1 to 6.9 and ORP between -85 mV and 75 mV. These monitoring wells were considered as the general background data points for the Site.
- *Ash Repository Background Monitoring Wells* – these wells are considered representative of background conditions in the north eastern section of the Site in the vicinity of the current ash repository where impact to groundwater from former mining activities have previously been reported (Connell Wagner, 2008; Aurecon, 2012). These include monitoring wells located upgradient from the current ash repository (MG\_X\_4/D5 and MG\_X\_MP1). Note that these monitoring wells were considered primarily for metal(loids) with elevated concentrations in the vicinity of the current ash repository.

It is noted that the a limited number of monitoring wells are available as background monitoring wells and that only one round of data is available for comparison of reported concentrations from these monitoring wells to the rest of the monitoring network established during the Stage 2 ESA. The evaluation of metal(loid) concentrations in relation to background conditions based on the approach outlined here should therefore be seen as a preliminary review of background conditions given the relatively limited nature of the background dataset. While the background dataset is limited, the approach does allow for the preliminary identification of potential background conditions.

The following discussion assesses the results for each metal(loid) initially in terms of exceedences of the adopted screening values; and secondly, where background concentrations exceed the adopted screening values, the data were then evaluated against the background concentrations. This is followed by a consolidated discussion on the overall distribution of metal(loid) concentrations across the Site.

#### *Arsenic*

The concentration of arsenic in groundwater exceeded the lowest adopted screening value (human health (drinking water)) in 13 of the 70 monitoring wells sampled, with the majority of these exceedences observed in monitoring wells located in the eastern area of the main operational area at the Power Station. Of these, the concentration of arsenic was above a factor of two of the maximum reported background concentration in five monitoring wells, indicating that the presence of arsenic in groundwater at these locations may represent a potential risk greater than that which can be attributed to local background conditions.

Generally, the highest arsenic concentrations were reported for monitoring wells located in the eastern area of the main operational area at the Power Station (MC\_MW04, MW-MW04, MJ\_X\_MWMP5 and MK\_MW11), and one monitoring well (MG\_X\_4/D4) located to the north east of the coal storage area and directly downgradient of a remnant mine spoil dump. No monitoring wells located in the vicinity of the current ash repository exceeded the maximum concentration from the Site Background Monitoring Wells.

#### *Boron*

Boron concentrations exceeded the lowest adopted screening value (ecological) in four monitoring wells (MG\_X\_4/D1, MG\_X\_4/D9, MG\_X\_4/D10 and MH\_MW03) located directly to the east and downgradient of the current ash repository. The boron concentrations in these four monitoring wells were between a factor of seven and more than an order of magnitude above the maximum concentration reported for the Ash Repository Background Monitoring Wells.

The highest boron concentration of 4,150 µg/L was reported for MG\_X\_4/D10, a monitoring well that is located cross-gradient of the current ash repository and down-gradient of the underground mine goaf located directly to the south of the ash repository. The other locations with elevated boron concentrations, MG\_X\_4/D1, MG\_X\_4/D9 and MH\_MW03 were located down-gradient of MG\_X\_4/D10 and the underground mine goaf areas.

#### *Cadmium*

Cadmium concentrations exceeded the lowest adopted screening value (ecological) in 19 of the 70 monitoring wells sampled, with exceedences of the adopted screening values in monitoring wells spread across the Site, including the main operational area of the Power Station, non-operational areas and the current ash repository area. Of these, the concentration of cadmium was a factor of two above the maximum reported background concentration in four monitoring wells. The highest reported cadmium concentrations were located directly downgradient of a remnant mine spoil dump to the north east of the coal storage area (MG\_X\_4/D4), upgradient of the current ash repository (MG\_X\_MP1), and adjacent to the underground mine goaf within the former Huons Gully (MG\_X\_4/D10 and MH\_X\_D15).

#### *Copper*

Copper concentrations in groundwater exceeded the lowest adopted screening values (freshwater) at 32 of the 70 monitoring wells sampled, with exceedences located across the Site, including the main operational area, non-operational areas and the current ash repository area. It is however noted that none of the samples exceeded the screening values for drinking water (2,000 µg/L). The concentration of copper was a factor of two above the maximum reported background concentration at ten monitoring wells, located



between the coal storage area and the water holding ponds (MJ\_X\_MWMP6, MI\_X\_5/D8, MI\_X\_5/D5, MG\_X\_MP1), near the operational ASTs (MF\_MW03), near a remnant mine spoil dump to the north east of the coal storage area (MG\_X\_4/D4, ML\_MW07), and in the former Huons Gully adjacent to the current ash repository (MH\_X\_D15, MG\_X\_4/D10, MH\_MW01).

The current ash repository does not appear to be a significant source of copper to groundwater given that the highest copper concentration was reported for monitoring well MG\_X\_MP1 located upgradient of the current ash repository.

#### *Lead*

Lead concentrations exceeded the lowest adopted screening values (freshwater) at 11 of the 70 monitoring wells sampled. Of these, the concentration of lead was a factor of two above the maximum reported background concentration at three monitoring wells. These three monitoring wells are located in the electrical transformers area (MC\_MW02), adjacent to the coal conveyor and coal crushing area (MK\_MW07) and to the north east of the coal storage area and directly downgradient of a remnant mine spoil dump (MG\_X\_4/D4).

#### *Manganese*

Manganese concentrations in groundwater in the majority of monitoring wells (59/70) exceeded the lowest adopted screening value (human health (drinking water)). The reported manganese concentrations were a factor of two above the maximum reported background concentration in one monitoring well (MI\_X\_5/D5) located directly downgradient of a wastewater pond.

#### *Nickel*

Nickel concentrations in groundwater in the majority of monitoring wells (66/70) exceeded the lowest adopted screening values (ecological). The reported concentrations were a factor of two above the maximum reported background concentration at four monitoring wells between the coal storage area and the water storage ponds (MI\_X\_5/D2, MK\_MW02, MK\_MW03, MK\_MW06), and seven monitoring wells located downgradient of the underground mine goaf and the current ash repository. The concentration of nickel in monitoring wells downgradient of the current ash repository (MG\_X\_4/D1 and MG\_X\_4/D9) is within a similar range to monitoring wells in the former Huons Gully downgradient of the underground mine goaf (MH\_MW01, MH\_MW03, MH\_X\_D15, MH\_X\_D19).

All seven monitoring wells downgradient of the underground mine goaf and the current ash repository had reported concentrations greater than a factor of two of the maximum reported concentration for the Ash Repository Background Monitoring Wells.

*Zinc*

Zinc concentrations in the majority of monitoring wells (67/70) across the Site exceeded the adopted screening value (ecological). The reported concentrations were a factor of two above the maximum reported background concentration at 18 monitoring wells across the site, including the water holding pond area, operational ASTs area, the main operational area of the Power Station, the coal storage area and the area located to the east of the current ash repository and underground mine goaf.

Zinc concentrations exceeded the maximum reported concentration for the Ash Repository Background Monitoring Wells at to MH\_X\_D15 located downgradient and to the east of the underground mine goaf (and upgradient of the current ash repository), monitoring well MG\_X\_4/D10 located in the former Huons Gully downgradient of the underground mine goaf and monitoring well MI\_X\_5/D5 located downgradient of a wastewater holding pond.

The highest zinc concentrations were observed in monitoring well MH\_X\_D15, located in the former Huons Gully, downgradient of the underground mine goaf and upgradient of the current ash repository. The concentrations of zinc in groundwater decrease in a north easterly and downgradient direction from MH\_X\_D15 to MH\_X\_4/D9; downgradient of the former underground mine goaf area which suggests that the elevated zinc concentrations are likely to be associated predominantly with the historical mine workings. The concentrations of zinc in groundwater in the western areas of the Site were less than a factor of two above the maximum reported background concentration.

*Summary*

Metals and metalloid concentrations in groundwater exceeded one or more of the adopted human health and/or ecological screening values in most monitoring wells across the Site. However, in the majority of monitoring wells metals and metalloid results fall within concentration ranges within a factor of two of the maximum concentrations seen in background monitoring wells.

Overall, groundwater monitoring wells with concentrations of metal(oids) equal to or above a factor of two of the maximum background concentrations were distributed in several key areas of the Site, including:

- in the main operation area, particularly between the coal storage area and the water holding ponds (MJ\_X\_MWMP6, MI\_X\_5/D8, MI\_X\_5/D5, MG\_X\_MP1, MK\_MW07 MI\_X\_5/D2, MK\_MW02, MK\_MW03, MK\_MW06). The groundwater in this area may be affected by backfilled former open cut mine workings and underground mine goaf areas that underlie the site;

- near a remnant mine spoil dump to the north east of the coal storage area (MG\_X\_4/D4, ML\_MW07). The sample taken from MG\_X\_4/D4 further had a significantly lower pH (pH 3.3) than the other monitoring wells affected by arsenic and it is probable that MG\_X\_4/D4 has been affected by leachate from the remnant mine spoil dump that may have undergone oxidation of sulfide material (resulting in the creation of acidic conditions) associated with mine spoil;
- downgradient of former underground mine goaf areas and the more recent former mine workings in Huons Gully, including the coal fines rejects (MH\_X\_D15, MG\_X\_4/D10, MH\_MW01, MG\_X\_4/D1, MG\_X\_4/D9 and MH\_MW03); and
- downgradient of the current ash repository and downgradient of former underground mine goaf areas and the more recent former mine workings in Huons Gully (MG\_X\_4/D1 and MG\_X\_4/D9).

### 5.5.2 *Groundwater Salinity Concentrations*

As discussed in *Section 5.4.7*, annual groundwater monitoring is undertaken in the vicinity of the ash repository. The results of previous groundwater monitoring have identified elevated boron and sulfate concentrations in the vicinity of the ash repository, as well as a marked increase in chloride concentrations in monitoring bore MPM4/D10 (MG\_X\_4/D10) (Aurecon, 2012). Whilst salinity, heavy metals and chloride are considered to be tracers for potential brine mobilisation from the ash repository, previous reports have identified sources of these impacts which are unrelated to the contributions from the ash repository. These other sources include historical coal mining operations and seepage from the coal washery rejects ponds within the former mine workings in Huons Gully.

Generally the field measurements of EC and laboratory analytical results for sodium and chloride were higher in most monitoring wells within the vicinity of the ash repository AECs (MG and MH) compared to other areas of the Site. The gauging data from the baseline ESA indicates an overall groundwater flow towards the north-east. EC readings of less than 1000  $\mu\text{S}/\text{cm}$  indicated that groundwater conditions were relatively fresh in wells up-gradient of the ash repository, on the northern perimeter (MG\_X\_MP1, MG\_X\_4/D4, MG\_X\_4/D5). Similar conditions were observed at monitoring well MH\_MW02 located within the recent former mine workings in Huons Gully but up-gradient of the identified coal fines rejects.

Comparatively higher EC readings (100-2000  $\mu\text{S}/\text{cm}$ ) and/or sodium (128-262 mg/L) and chloride (68-147 mg/L) concentrations in groundwater were reported at monitoring wells:

- within the coal fines rejects area in Huons Gully (MH\_X\_D15, MH\_MW01); and

- on the downgradient perimeter of the current ash repository and Lamberts North (MH\_X\_D19, MG\_X\_4/D1 and MG\_X\_4/D9).

The highest readings of EC and concentrations of sodium and chloride in groundwater in the baseline ESA were reported at MG\_X\_4/D10 and MH\_MW03. These wells are located on the southern perimeter of the current ash repository and are both downgradient of the former underground mine goaf areas and the more recent former mine workings in Huons Gully, including the coal fines rejects.

With the exception of MG\_X\_4/D10 and MH\_MW03 the concentrations of chloride and sodium in groundwater in the vicinity of the ash repository (AECs, MG and MH) were less than a factor of two of the maximum reported background concentration at ML\_MW05 and are therefore considered to be indicative of local background conditions.

Based on the available data, whilst there are elevated concentrations of sodium and chloride concentrations in the vicinity of MG\_X\_4/D10 and MH\_MW03, the groundwater quality on the down-gradient perimeter of the Site (based on groundwater sampling results from monitoring wells MH\_X\_D19, MG\_X\_4/D1 and MG\_X\_4/D9) is considered to be within the expected range for local background conditions.

Potential sources of the elevated sodium and chloride concentrations at MG\_X\_4/D10 and MH\_MW03 include contributions from the up-gradient underground mine goaf areas, and the coal fines rejects within the recent former mine workings in Huons Gully. Based on the available data the contribution of sodium and chloride from the former mining activities cannot be distinguished from potential contributions from the current ash repository.

## 5.6

### *DATA QUALITY*

The data presented in the ESA was considered to generally be of a suitable quality and completeness to provide a baseline of environmental conditions at the Site. Whilst some minor non-conformances have been identified in relation to field and laboratory QA/QC, these are not considered to have a material impact on the outcomes of this assessment.

A summary of the locations unable to be completed due to various reasons is provided in *Table 3.1*. In locations where soil bores could not be excavated to the target depth due to proximity to known or suspected sub-surface utilities, surface soil samples were collected using a hand trowel.

A discussion of the limitations and uncertainties associated with the investigation is included in *Section 3.5* and a discussion of the suitability of the data and the requirement for further investigation included in *Section 5.7.5*. The discussion of the CSM provided in the *Section 5.7.1* and *Section 5.7.2* and summarised in *Annex C* is based on the following assumptions:

- the understanding of the potential sources as detailed in *Section 5.4* and *Section 5.7.1*;
- potential receptors were identified in *Section 2.9* and *Section 5.7.1* based on publically available information; and
- potential exposure pathways to receptors are based on ongoing use of the Site as a Power Station in the same or similar configuration to that observed at the time of this assessment.

## 5.7 **OVERALL DISCUSSION**

The primary objective of this Phase 2 ESA was to develop a baseline assessment of environmental conditions at the site and within the immediate surrounding receiving environments at or near the time of the transaction. The results of the assessment have also been used to assess:

- The nature and extent of soil and/or groundwater impact on / beneath the Site and in relation to neighbouring sensitive receptors.
- Whether the impacts at the Site represent a risk to human health and/or the environment, based on the continuation of the current use.
- Whether the impact at the Site is likely to warrant notification /regulation under the *CLM Act 1997*.
- Whether material remediation is considered likely to be required.
- Whether the data collected during the assessment was of a suitable quality and completeness to provide a baseline of environmental conditions at the Site.

The overall results of the assessment are discussed herein, with reference to these objectives and the CSM. The CSM developed as part of the *SAQP* (ERM, 2013a) was revised to incorporate overall results of the assessment and is presented in the following *Sections 5.7.1 and 5.7.2* as well as graphically represented in *Annex C*.

### 5.7.1 **Summary - The Nature and Extent of Soil, Sediment, Groundwater and Surface Water Impact**

A CSM was developed and refined, which identified the following ecological and human receptors:

- onsite employees, including intrusive workers potentially labouring within shallow trenches/excavations;
- recreational users of Neubecks Creek, and Lake Lyell;

- terrestrial ecological receptors within the open space areas both on and surrounding the Site; and
- freshwater aquatic organisms within Lake Lyell, Thompsons Creek Reservoir, Neubecks Creek.

Soil, sediment, surface water and groundwater data were compared against published environmental quality levels to provide a screening level assessment of potential risks to these identified receptors. The findings of the screening process indicated that concentrations in soil, sediment, surface water and groundwater generally complied with the adopted screening values, with some exceptions as discussed in the following sections. Potential source-pathway-receptor linkages identified in the preliminary ESA were subsequently revised on the basis of the available data and the refinement of receptors, as discussed in *Section 5.6.2*.

#### *Onsite Soil*

- Copper, nickel and/or zinc were detected at concentrations in excess of the adopted ecological screening value for commercial/industrial sites in soil samples collected from MK (Operational Area) and ML (Buffer Lands and Former Contractors Yard).
- TRH was detected at concentrations in excess of the adopted ecological screening value for commercial/industrial sites in soil samples collected from MD\_MW04 and MK\_SB87.

#### *Onsite Groundwater*

- LNAPL was detected in three groundwater monitoring wells;
- Benzene was detected at concentrations in excess of the adopted human health (drinking water) screening values in groundwater samples collected from AECs MJ (Operational USTs).
- Metals and metalloid concentrations in groundwater exceeded one or more of the adopted human health and/or ecological screening values in most monitoring wells across the Site. Where metals were above background concentrations, impact generally appears to be related to contributions from former mine workings both on the Site and in surrounding areas.
- Overall, groundwater monitoring wells with concentrations of metal(oids) equal to or above a factor of two of the maximum background concentrations were distributed in several key areas of the Site, including:
- in the main operation area, particularly between the coal storage area and the water holding ponds (MJ\_X\_MWMP6, MI\_X\_5/D8, MI\_X\_5/D5, MG\_X\_MP1, MK\_MW07 MI\_X\_5/D2, MK\_MW02, MK\_MW03, MK\_MW06). The groundwater in this area may be affected by backfilled

former open cut mine workings and underground mine goaf areas that underlie the site;

- near a remnant mine spoil dump to the north east of the coal storage area (MG\_X\_4/D4, ML\_MW07). The sample taken from MG\_X\_4/D4 further had a significantly lower pH (pH 3.3) than the other monitoring wells affected by arsenic and it is probable that MG\_X\_4/D4 has been affected by leachate from the remnant mine spoil dump that may have undergone oxidation of sulfide material (resulting in the creation of acidic conditions) associated with mine spoil;
- downgradient of former underground mine goaf areas and the more recent former mine workings in Huons Gully, including the coal fines rejects (MH\_X\_D15, MG\_X\_4/D10, MH\_MW01, MG\_X\_4/D1, MG\_X\_4/D9 and MH\_MW03); and
- downgradient of the current ash repository and downgradient of former underground mine goaf areas and the more recent former mine workings in Huons Gully (MG\_X\_4/D1 and MG\_X\_4/D9).

#### *Onsite Sediments*

- Copper, nickel and zinc concentrations exceeded the ISQG-Low in one sample from Lake Lyell; however all concentrations were below the ISQG-High.
- Copper and lead concentrations exceeded the ISQG-Low in one sample from Thompsons Creek Reservoir; however all concentrations were below the ISQG-High.
- There were no applicable Australian screening values identified for TRH in sediment in fresh water environments. It was noted that one sample from Lake Lyell marginally exceeded the adopted screening value, however the adopted screening level is applicable to marine environments.

#### *Onsite Surface Water*

- Concentrations of metals in surface water in Lake Lyell and Thompsons Creek Reservoir were below the adopted human health (drinking water and recreational) screening values in all samples.
- Concentrations of metals in surface water in Lake Lyell and Thompsons Creek Reservoir were below the adopted ecological screening values, with the exception of zinc and copper.
- Copper concentrations in surface water in Lake Lyell and Thompsons Creek Reservoir marginally exceeded the ecological screening values in the majority of surface water samples analysed. The prevalence of copper in all samples marginally above the adopted ecological criteria indicates that the

concentrations are likely attributable to local background conditions in the catchment.

- Zinc concentrations in surface water marginally exceeded the ecological screening values in one sample from in Lake Lyell and one sample from Thompsons Creek Reservoir. This is likely attributable to local background conditions in the catchment, including discharges from Cox River and Farmers Creek.

#### *General Observations*

LNAPL was observed at three sampling locations within Area ME (Mobile Plant Refuelling Area).

Asbestos fibres were not detected within any soil samples analysed at the Site. It is however noted that the vertical boring of soils is not an ideal method via which to identify asbestos impacts in soils. The absence of asbestos within fill materials or upon surface soils in other areas across the Site therefore cannot be guaranteed on the basis of the results of this assessment. Similarly, as with any investigation of this nature, the potential exists for unidentified contamination to exist between the completed sampling locations both within and between AECs.

#### 5.7.2

#### *Summary – Does the Identified Impact Represent a Risk to Human Health and/or the Environment?*

The approach to the screening of the data gathered in this assessment was to initially adopt the most conservative potential assessment values to consider all potential receptors identified in the CSM (*Annex C*). The exceedences of the screening values outlined in *Section 3.5.2* were subsequently assessed on a case by case basis, in light of the specific characteristics of the individual samples and the AEC from which those samples were collected. The conclusions of these further assessments were incorporated into the CSM as presented in the following sections and summarised in *Annex C*. Potential source-pathway-receptor linkages identified in the preliminary ESA were subsequently revised on the basis of the available data and the refinement of receptors.

#### *Onsite Soil*

The soil results from all AECs at the Site comply with the applicable human health and ecological criteria for the current and on-going land-use with some minor exceptions as outlined below.

Copper, nickel and/or zinc were detected at concentrations in excess of the EIL for commercial/industrial sites in soil samples collected from AECs MK (Operational Area) and ML (Buffer Lands and Former Contractors Yard).



Copper was detected above the adopted EIL in AEC MK at one location, MK\_SB33 at a depth of 1.5 m bgl. Statistical assessment of copper concentrations in soils within AEC MK demonstrated that this exceedence is a localised hotspot, and is unlikely to represent a significant risk to the terrestrial environment under the ongoing use of the Site as a power station.

The copper and nickel concentrations at ML\_SB36 were >250% of the ecological screening criteria. Red sand was present at the surface at ML\_SB36, extending from a nearby workshop building and covering an area of approximately 100 m<sup>2</sup>. The depth of the red sand is anticipated to be < 0.3 m bgl, based on the depth to bedrock (shale) encountered at ML\_MW20 to the north. This sand is likely a product of grit blasting on open ground from historical operations relating to Site construction activities.

Current Site practices should be reviewed to ensure that such activities are currently carried out in appropriate areas where waste products can be managed accordingly.

Shale bedrock outcrops were observed at the surface in this area, with shallow soils typically less than 0.5 m bgl in this area. There is limited soil to support plant growth, and it is unlikely to represent an area of high ecological significance. These impacts are considered unlikely to represent a significant risk to the terrestrial environment under the ongoing use of the Site as a Power Station.

It is recommended that the red sand visible in the area to the south of the workshop building be removed from this area as part of general housekeeping.

Total Recoverable Hydrocarbons in the C10-C16 fraction were detected at a concentration in excess of the ESL for commercial/industrial sites in a soil sample collected from MK\_SB87 at a depth of 1.0 m bgl, associated with an odour and an elevated PID reading. The measured concentration of TRH in the deeper soil sample collected at 3 m bgl was below the laboratory LOR and TRH concentrations were below the laboratory LOR in groundwater samples from this area (MK\_SB87/MK\_MW04).

Operational activities in this area include an ash washdown pit, miscellaneous pumps and the day maintenance building. Sub-surface infrastructure in this area includes stormwater, contaminated waste water and ash washwater drainage pipes. It is recommended that the integrity of the contaminated waste water drainage pipes be inspected to assess the potential for further impact. It was noted that vegetation in this area is limited to grass on landscaped areas. Grasses have a shallow root zone and impacts at a depth of 1.0 m bgl are therefore considered unlikely to represent a significant risk to the terrestrial environment under the ongoing use of the Site as a power station.

Total Recoverable Hydrocarbons in the C10-C16 fraction and C16-C34 fractions were detected at a concentration in excess of the ESL for commercial/industrial sites in a soil sample collected from 1.2 m bgl at MD\_MW04. The hydrocarbon impacts identified at this location may be related to historical leaks or spills associated with workshop activities in this area. Area MD is largely covered in concrete hardstanding, with some grass areas around service easements. Area MD is not considered to have any significant ecological value and thus the application of the ESLs is considered to be overly conservative in this instance.

Based on the discussion provided herein, it is considered that whilst exceedences of the ecological screening levels in soils were identified, the relevant source-pathway-receptor linkages are incomplete.

### ***On-site Groundwater***

#### *Sensitivity of Receiving Environments*

Groundwater beneath the Site is not extracted for potable use and a search of licensed groundwater bores has not identified any potential groundwater abstraction receptors in the vicinity of the Site. The highly disturbed nature of the region through coal mining reduces the potential for the potable or domestic use of groundwater in the vicinity of the Site to be approved in the future.

The groundwater beneath the Site could be considered to be an aquatic environment of significance. However, as discussed in *Section 5.5*, the regional groundwater has elevated concentrations of heavy metals which originate from the characteristics of the local geology, and also have been degraded by historical mining activities.

Based on the topography and available hydrological information, groundwater beneath the Site is considered to ultimately discharge to Neubecks Creek, a tributary of the Coxs River. The volume of flow in the upper reaches of Neubecks Creek adjacent to the Site are noted to be intermittent, with typically low volumes of flow of <1ML/day (BOM, 2014). It is further noted that groundwater may not be a major contributor to surface water in Neubecks Creek, as the connection between the groundwater on the Site and Neubecks Creek may not be complete. Reaches of Neubecks Creek have been defined as “losing” streams, whereby the base level of the creek is above the level of groundwater aquifer (R.W. Corkery & Co., 2010). It is important to note that the only direct discharges to surface water from the Site are stormwater drainage discharged from a holding pond at LDP1 on Neubecks Creek which is managed and regulated under the EPL.

The quality of the Coxs River catchment has been degraded by industrial activities in the broader catchment, including coal mining, mine discharges, sewage treatment, and the operation of two power stations (Mt Piper and Wallerawang further downstream) (Birch et al, 1999).

The Coxs River discharges into Lake Wallace, downstream of the Wallerawang Power Station. The quality of the surface water and sediments in Lake Wallace are discussed in *Project Symphony – Wallerawang Phase 2 Environmental Site Assessment* (ERM, 2014), and as such are not considered further here. In a study of sediments on the Coxs River catchment, Birch et al (1999) concluded that Lake Wallace impedes the migration of a large proportion of heavy metals, reducing the amounts of heavy metals entering Lake Burragorang, the main drinking water reservoir for Sydney.

The ANZECC (2000) *freshwater ecological trigger values* were adopted in this assessment adopted to evaluate the requirement to report groundwater contamination across the Site, in accordance with the DECC (2009) *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997* (refer to Section 5.7.3). However, it is noted that due to the degraded quality of the background groundwater and the receiving surface waters the adoption of a lower threshold of protection of species may be appropriate. As set out in the ANZECC (2000) guidelines however, the adoption of a lower level of should only be undertaken following consultation with relevant stakeholders and may also require more detailed assessment of potential toxicity, hence the 95% and 99% guidelines (for potential bioaccumulation of mercury and selenium) are considered the most appropriate for initial screening purposes in this assessment.

The NHMRC (2008) recreational screening values were adopted in this assessment adopted to evaluate potential risks to recreational users of Neubecks Creek, Coxs River, and Lake Wallace further downstream. There are no known recreational users of Neubecks Creek and the upper reaches of the Coxs River, however as public access cannot be precluded, these receptors have been considered for the purpose of this assessment.

The NHMRC (2013) drinking water screening values were also adopted to evaluate the requirement to report groundwater contamination across the Site, in accordance with the DECC (2009) *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997* (refer to Section 5.7.3).

### ***Hydrocarbons in Groundwater***

#### *Potential Sources*

As discussed in Section 5.4.10, benzene was detected at concentrations in excess of the adopted human health (drinking water) screening values in groundwater samples collected from AEC MJ (Operational USTs). It is noted that this is an existing well. The benzene exceedence at this location is attributable to the UST and associated fuel lines or possible surface spills. It is recommended that the integrity of the UST and lines in this location be tested to confirm the absence of sub-surface leaks.

As groundwater in the vicinity of the Site is not extracted for drinking water, the presence of benzene in excess of the adopted human health (drinking water) screening values is not considered to represent a significant risk to the humans under the ongoing use of the Site as a power station.

ERM understands that the current site operator (Energy Australia) (and prior to the transaction Delta Electricity) has been developing appropriate management approaches in relation to this issue alongside independent consultants and regulators. It is noted that Delta Electricity has previously notified this issue to NSW EPA. It is considered that the costs for management of this issue may be potentially material depending on the remediation / management option selected.

As discussed in *Section 5.4.5*, LNAPL was detected in three groundwater monitoring wells in Area ME. There have been no reported surface spills and integrity tests of the current UST near ME\_X\_MW7 have not identified any issues. The source of the LNAPL has not been definitively identified, and other underground infrastructure in this area has not been investigated to-date. The oil-water separator drains through an underground pipe in a north-easterly direction, discharging into an open surface water drain along the coal storage area boundary. The bobcat pit drains to an oil collection pit which is pumped out by a road tanker.

Groundwater flow direction across the Site is typically to the north-east, as indicated in *Figure 6.1, Annex A*. In the AEC ME, groundwater flow direction appears to be mounded in the area of ME\_X\_MWMP8, adjacent to the oil-water interceptor, as shown in *Figure 6.3, Annex A*.

Aside from an unknown historical surface spill, on-going leaks in underground infrastructure in the vicinity, including the bobcat pit, the oil-water separator or the drainage pipe from the oil-water interceptor are potential sources of contamination. Both the sewer main and the oil-water interceptor drainage pipe cross through the area of the LNAPL plume, and the service trenches around these pipes are considered potential preferential pathways for migration of contaminants.

#### *Human Receptors – Exposure Pathways (Dermal, Ingestion, Inhalation)*

Groundwater beneath the Site is not extracted for potable use and a search of licensed groundwater bores has not identified any potential groundwater abstraction receptors in the vicinity of the Site. Groundwater is present at depths greater than 3.5 m bgl, therefore there are no feasible direct contact exposure pathways (ingestion and/or dermal absorption) for human receptors to encounter LNAPL and/or potential dissolved phase hydrocarbons. Based on the available information this source-pathway-receptor linkage has been discounted.

There may be a risk to workers on-site from vapour intrusion inside the workshop buildings if the LNAPL plume extends beneath the building. There

may also be a risk to intrusive maintenance workers from vapours when conducting excavation works in trenches for sub-surface utility maintenance or future construction; however it is noted that normal trench excavation is unlikely to encounter LNAPL present at depths of greater than 3.5 m bgl.

Vapour intrusion risks are considered to be unlikely given the current use of this area, however cannot be discounted on the basis of the current data. It is noted that the workshop buildings are well ventilated with roller door access and typically open to the outdoors. A potentially complete source-pathway-receptor linkage does however remain in relation to potential inhalation exposure for industrial workers and/or intrusive maintenance workers.

On the basis of the current data, the down-gradient extent of the plume appears to have been delineated to the south of the coal stockpile area, with a down-gradient monitoring well ME\_X\_MW06 located approximately 12 m to the north of ME\_X\_MW03.

However, it is noted that the existing monitoring wells in this area (including recently installed wells by SMEC) are not screened consistently, with groundwater intercepted in two different lithologies. LNAPL has been identified in monitoring wells screened in fill materials at depths of 3-6 m bgl at ME\_X\_MWMP7, and 1-4 m bgl at ME\_X\_MWMP8. LNAPL has also been identified in monitoring well ME\_X\_MWMP12 screened in sandstone, at a depth of 4-7 m bgl.

#### *Ecological Exposure Pathways*

On the basis of the current data, and the distance to the downgradient Site boundary being more than 750 m to the north-east, it is unlikely that the LNAPL plume will foreseeably impact on the closest ecological receptor, Neubecks Creek, located on the north-east boundary of the Site.

#### *Metals in Groundwater*

##### *Potential Sources*

Monitoring wells across the Site reported concentrations of a wide range of metals at concentrations exceeding the adopted human health and / or ecological screening values as discussed in *Section 5.5*.

The regional groundwater has elevated concentrations of heavy metals which originate from the characteristics of the local geology, and also have been degraded by historical mining activities. The concentrations of metals in groundwater across the Site are generally comparable to up-gradient background monitoring wells. Where metals are above background concentrations, the impacts appear to be associated with contributions from former mine workings both on the Site and in surrounding areas.

The contribution of the ash repository to metals concentrations in groundwater cannot be differentiated from the contribution of the former

mine workings. However, it is noted that the concentrations of most metals in groundwater downgradient of the current ash repository (MG\_X\_4/D1 and MG\_X\_4/D9) is within a similar range to monitoring wells in the former Huons Gully downgradient of the underground mine goaf (MH\_MW01, MH\_MW03, MH\_X\_D15, MH\_X\_D19). It is further noted that the contribution of the current ash repository to metals concentrations in groundwater was considered in the approval for the Mt Piper Ash Placement Project, which was approved by the Minister for Planning and Infrastructure under the *Environmental Planning and Assessment Act 1979* (NSW), and measures were implemented to minimise potential additional metals loadings from the current ash repository, and the extension into Lamberts North.

#### *Human Exposure Pathways*

Based on the available information potential source-pathway-receptor linkages have been discounted. In summary, the CSM was revised to consider the following source-pathway-receptor linkages:

- Ingestion - groundwater in the vicinity of the Site is not extracted for drinking water.
- Dermal absorption - direct contact with groundwater is unlikely based on the depth to groundwater and the on-going operations at the Site. Based on the available information this source-pathway-receptor linkage has been discounted.
- Inhalation - there are no potential inhalation exposure risks associated with metals in groundwater. Based on the available information this source-pathway-receptor linkage has been discounted.
- Ecological exposure pathways

The significance of potential impacts to ecological receptors in both groundwater and surface water is unclear, given the degraded quality of background groundwater and surface water and the undetermined connection of groundwater to Neubecks Creek. Given that potential groundwater discharges to Neubecks Creek occur up-stream of a highly disturbed catchment, including mine discharges (under existing EPLs) downstream of the confluence with the Coxs River, and licenced discharges from Wallerawang Power Station, the cumulative impact of these off-site sources to ecological receptors must be considered.

The quality of groundwater in the vicinity of the current ash repository and Lamberts North have been considered by several regulatory agencies (including the Sydney Catchment Authority and NSW Office of Water) in the approval for the Mt Piper Ash Placement Project, which was approved by the Minister for Planning and Infrastructure under the *Environmental Planning and Assessment Act 1979* (NSW). Further consultation with the appropriate regulatory agencies, including NSW EPA, is recommended to assess the

appropriate management of this issue under the CLM Act (1997) and/or the *POEO Act* (1997).

### 5.7.3 *Summary – Does the Impact Warrant Notification under the Contaminated Land Management Act 1997?*

Under section 60 of the *CLM Act 1997*, a person whose activities have contaminated land or a landowner whose land has been contaminated is required to notify NSW EPA when they become aware of the contamination. The DECC (2009) *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997*, state that a landowner or a person whose activities have contaminated land is required to notify NSW EPA that the land is contaminated if;

- the level of the contaminant exceeds the appropriate published screening level with respect to a current or approved use of the land, **and** people have been, or foreseeably will be, exposed to the contaminant; or
- the contamination meets a specific criterion prescribed by the regulations; or
- the contaminant has entered, or will foreseeably enter, neighbouring land, the atmosphere, groundwater or surface water, **and** the contamination exceeds, or will foreseeably exceed, an appropriate published screening value and will foreseeably continue to remain above that level.

The soil and groundwater results obtained in this assessment have been compared against the screening values specified in NSW DECC (2009) *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997* and a number of exceedences have been identified.

Every exceedence of these screening values is not, however, required to be reported to the NSW EPA. If the exceedence is representative of background conditions; or offsite migration of contamination to an adjoining property has not occurred **and** any onsite contamination has been adequately addressed under the Environmental Planning and Assessment Act then reporting under the CLM Act is not required. Further to this, in the case of onsite soil contamination, if no plausible exposure pathway to people or the environment is present, reporting is also not required.

On the basis of the discussions outlined in *Section 5.6.2*, the constituents that have been identified in onsite soil, sediment, surface water and groundwater are generally not exceeding the relevant screening values as cited in NSW DECC (2009).

The identified impacts which do exceed the relevant screening values and are considered to warrant further consideration with regards to whether a duty to report may exist under the CLM Act include the following:

- LNAPL detected in groundwater in Area ME, which has previously been reported to NSW EPA under the CLM Act;
- benzene was detected at a concentration in excess of the adopted human health (drinking water) screening values in groundwater at MJ\_X\_MWMP1;
- heavy metals in groundwater detected at concentrations not attributable to natural background conditions in groundwater at various locations across the Site.

Each of these issues is discussed in further detail below.

#### *LNAPL In Groundwater - AEC ME*

LNAPL was detected in two groundwater monitoring wells on the northern side of the wash bay, adjacent to the oil-water separator (ME\_X\_MWMP8 and ME\_MW03), and one monitoring well on the southern side of the wash bay, adjacent to the diesel UST and bowser (ME\_X\_MWMP7).

LNAPL was previously identified in one groundwater monitoring well (ME\_X\_MWMP8) in October 2012 (SMEC 2012). Subsequent fingerprinting analysis of the LNAPL identified this is most likely weathered diesel with an estimated age of 25 years (+/- 5 years). Based on the age of the weathered diesel, and the findings of the tank integrity tests for the diesel UST near ME\_X\_MWMP7 it was concluded that the LNAPL was related to an historical spill and not an underground release from the current UST.

The source of the LNAPL has not been definitively identified, and other underground infrastructure in this area has not been investigated to-date. The oil-water separator drains through an underground pipe in a north-easterly direction, discharging into an open surface water drain along the coal storage area boundary. The bobcat pit drains to an oil collection pit which is pumped out by a road tanker.

Aside from an unknown historical surface spill, on-going leaks in underground infrastructure in the vicinity, including the bobcat pit, the oil-water separator or the drainage pipe from the oil-water interceptor are potential sources of contamination.

Both the sewer main and the oil-water interceptor drainage pipe cross through the area of the LNAPL plume, and the service trenches around these pipes are potential preferential pathways for migration of contaminants.

Delta Electricity has previously reported the presence of LNAPL to NSW EPA in compliance with the requirements of the *Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2008 (NSW)*. Concurrent investigations were undertaken by SMEC on behalf of Energy Australia in November 2013, and routine monitoring is undertaken in compliance with the *POEO (UPSS) Regulation 2008*.



Notification to NSW EPA has already been initiated by Delta Electricity/EnergyAustralia, and it is recommended that this additional information is communicated to NSW EPA by EnergyAustralia. It would be prudent to undertake an additional round of confirmatory groundwater sampling at the cross-gradient locations near ME\_X\_MWMP8, to confirm the delineation of LNAPL prior to reporting to NSW EPA. This may already be scheduled as part of the existing scheduled UPSS monitoring program.

#### *Benzene in Groundwater AEC MJ*

Benzene was detected at a concentration marginally above the adopted human health (drinking water) screening values in groundwater at MJ\_X\_MWMP1 adjacent to a UST and fuel bowsers. Given that the detection within of benzene AEC MJ (MJ\_X\_MWMP1) was only marginally above the screening value, it is suggested that an additional round of confirmatory sampling be undertaken to confirm these results and assess the likelihood that the detected concentration will foreseeably remain above the human health (drinking water) screening value.

It is however considered unlikely in ERM's opinion that these impacts would be considered significant enough to warrant regulation by the NSW EPA given the absence of groundwater use on-site, it's already degraded nature and the proximity of the result to the screening value.

#### *Metals in Groundwater*

Various metals were detected at concentrations above the human health (drinking water) and / or ecological screening values which were not attributable to background conditions in groundwater at a number of locations across the Site. The concentrations of metals in groundwater across the Site are generally comparable to up-gradient background monitoring wells. Where metals are above background concentrations, impact generally appears to be associated with former mine workings both on the Site and in surrounding areas.

The contribution of the ash repository to metals concentrations in groundwater cannot be differentiated from the contribution of the former mine workings. However, it is noted that the concentrations of most metals in groundwater downgradient of the current ash repository (MG\_X\_4/D1 and MG\_X\_4/D9) lie within a similar range to concentrations in monitoring wells in the former Huons Gully, downgradient of the underground mine goaf (MH\_MW01, MH\_MW03, MH\_X\_D15, MH\_X\_D19). It is further noted that the contribution of the current ash repository to metals concentrations in groundwater was considered in the approval for the Mt Piper Ash Placement Project, which was approved by the Minister for Planning and Infrastructure under the *Environmental Planning and Assessment Act 1979* (NSW), and

measures were implemented to minimise potential additional metals loadings from the current ash repository, and the extension into Lamberts North.

A summary of metals exceeding screening values with regard to the duty to report is provided in *Table 5.16* (over).

Table 5.16 Groundwater Screening in Relation to Potential Duty to Report

Metal	Data Range (µg/L)	Data Average (µg/L)	Background* Maximum (µg/L) Site/Ash	WMP ANZECC (2000) Modified^	Exceedences of Human Health (Drinking Water) or Ecological Screening Value	Relevant AECs #
Arsenic	0.4 - 129	8	10	24	Yes, ecological, drinking water and recreational value exceeded. Arsenic concentrations were above a factor of two of the maximum reported background concentration in five monitoring wells, four (MC_MW04, MC_MW04, MJ_X_MWMP5 and MK_MW11) of which are located in the eastern area of the main operation area at the Power Station, and one monitoring well (MG_X_4/D4) located to the north east of the coal storage area and directly down-gradient of a remnant mine spoil dump. These five monitoring wells with exceedences higher than background in particular may warrant reporting.	MC, MG MJ, MK ML
Boron	16 - 4150	198	<50 (289)	370	Yes, ecological and drinking water value exceeded. Boron concentrations in monitoring wells MG_X_4/D1, MG_X_4/D9, MG_X_4/D10 and MH_MW03 were between a factor of seven and more than an order of magnitude above the maximum concentration reported for the Ash Repository Background Monitoring Wells. It should be noted that the majority of the noted exceedences are in the vicinity of the Ash Repository which is regulated under the Site EPL.	MG, MH
Cadmium	<0.05 - 7.4	0.37	0.5	1	Yes, both ecological and drinking water were exceeded. Reported concentrations a factor of two above the maximum reported background concentration were limited to four monitoring wells; MG_X_4/D4 located to the north east of the coal storage area and directly down-gradient of a remnant mine spoil dump, MG_X_MP1 located upgradient of the current ash repository, MG_X_4/D10 located down-gradient of both the underground mine goaf and the current ash repository, and MH_X_D15 located adjacent to the underground mine goaf. These four monitoring wells with exceedences higher than background in particular may warrant reporting.	MG, MH, ML
Chromium	<0.2-10	0.58	na	1	Yes, ecological value marginally exceeded in three locations.	MD, MG, MH
Copper	0.5-39.4	3.1	2	2.5	Yes, ecological value exceeded. Reported concentrations a factor of two above the maximum reported background concentration were limited to ten monitoring wells located in the water holding pond area, operational ASTs area, the main operational area of the Power Station, non-operational areas and the current ash repository. The results indicate that the presence of copper impact above background concentrations are relatively localised on site within distinct areas, and that the current ash repository is not a significant source of copper to groundwater given that the highest copper concentration was reported for monitoring well MG_X_MP1 located upgradient of the current ash repository. These ten monitoring wells with exceedences higher than background in particular may warrant reporting.	MF, MG, MH, MI, MK, ML
Lead	<0.1-47	3.3	13	5	Yes, both ecological and drinking water values were exceeded. Reported concentrations a factor of two above the maximum reported background concentration were limited to three monitoring wells located in the electrical transformers area, the operational area and to the north east of the coal storage area and	MC, MK, ML

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Metal	Data Range (µg/L)	Data Average (µg/L)	Background* Maximum (µg/L) Site/Ash	WMP ANZECC (2000) Modified^	Exceedences of Human Health (Drinking Water) or Ecological Screening Value	Relevant AECs #
					directly downgradient of a remnant mine spoil dump (MG_X_4/D4). The results indicate that the presence of lead impact above background concentrations are highly localised in distinct areas on site, and that the current ash repository is not a significant source of lead to groundwater. These three monitoring wells with exceedences higher than background in particular may warrant reporting.	
Manganese	50-20,300	4420	9870	1900	Yes, ecological, drinking water and recreational value exceeded. Reported concentrations a factor of two above the maximum reported background concentration were limited to one monitoring well (MI_X_5/D5) located directly downgradient of a wastewater pond. The results therefore indicate that the presence of manganese impact above background concentrations is limited to a highly localised part of the water holding pond area. Monitoring wells MI_X_5/D5 with exceedence higher than background in particular may warrant reporting.	MI
Nickel	2-990	152	82 (172)	17	Yes, both ecological and drinking water values were exceeded. Reported concentrations a factor of two above the maximum reported background concentration were limited to three monitoring wells located at the water storage ponds (MI_X_5/D2, MK_MW03, MK_MW06), one in the main operational area at the Power Station (MK_MW02) and a further seven monitoring wells located downgradient of the underground mine goaf and the current ash repository. The monitoring wells downgradient of the underground mine goaf and the current ash repository had reported concentrations above a factor of two of the maximum reported concentration for the Ash Repository Background Monitoring Wells (MG_X_4/D1, MG_X_4/D10, MG_X_4/D9, MH_MW01, MH_MW03, MH_X_D15, MH_X_D19). These eleven monitoring wells with exceedences higher than background in particular may warrant reporting.	MG, MH, MI, MK,
Zinc	<5 - 2300	176	56 (427)	116	Yes, ecological water values were exceeded. Reported concentrations a factor of two above the maximum reported background concentration included samples taken from 18 monitoring wells spread across the site, including the water holding pond area, operational ASTs area, the main operational area of the Power Station, the coal storage area (MB_MW02, MB_MW03, MB_MW05, MF_MW03, MG_X_4/D4, MI_X_5/D2, MK_MW02, MK_MW03, MK_MW09, MK_MW11, ML_MW08). Monitoring wells exceeding the maximum reported concentration for the Ash Repository Background Monitoring Wells included MG_X_MP1 MG_X_4/D10, MH_MW01, MH_MW03, MH_X_4/D8, MH_X_D15 and MH_X_D19. These 18 monitoring wells with exceedences higher than background in particular may warrant reporting.	MB, MF, MG, MH, MI, MK, ML

Notes: \* = Background values assessed as concentrations a factor of two above the maximum reported concentration in a background monitoring well.  
^ Connell Wagner (2008). Mt Piper Power Station Brine Conditioned Fly ash Co-placement Extension Water Management and Monitoring Plan. Delta Electricity Western. May 2008.  
# = AECs with concentrations above background values where background values exceed one or more of the screening values.

Whilst many of the metals exceedences can be related to background concentrations, some elevated concentrations appear to be related to contributions from former mine workings both on the Site and in surrounding areas.

Groundwater impacts related to activities undertaken within the ash repository (including the extension to Lamberts North) are already regulated and monitored under the Site EPL. It is noted that the construction of the Lamberts North Ash Repository was approved by the Minister for Planning and Infrastructure under the *Environmental Planning and Assessment Act 1979* (NSW).

In ERM's professional experience it is NSW EPA's preference to regulate issues such as these under either the *POEO Act (1997)* or the *CLM Act (1997)* rather than both, and, in the case of licensed premises, it is usually the *POEO Act (1997)* which is preferred.

Groundwater impacts above background conditions within the main operational areas of the Site, and on the down-gradient boundary can be attributed to contributions from former mine workings both on the Site and in surrounding areas. In this instance, groundwater impacts are not currently regulated under the Site EPL, however it is noted that any potential discharge to surface water in Neubecks Creek would occur up-stream of potential discharges from groundwater beneath the ash repository. Therefore, ERM therefore considers that NSW EPA would most likely continue to manage this issue under the *POEO Act (1997)* via the Site EPL (including the existing groundwater and surface water monitoring program), and hence would not require formal notification under the CLM Act, however this approach should be confirmed with NSW EPA to ensure strict adherence to the NSW DECC (2009) guidelines. Some modification to the existing groundwater and surface water monitoring program under the EPL may be required.

#### 5.7.4 ***Summary – Is Material Remediation or Management Likely to be Required?***

Based on the results of this assessment, the issues where potentially material remediation or management on a per source basis is likely to be required relate to the LNAPL identified in groundwater at the Mobile Plant Refuelling Area (ME). This issue was identified by Delta Electricity previous to this assessment, and has been officially notified to NSW EPA under Section 60 of the CLM Act. Further investigations into the extent of the LNAPL plume were conducted by Energy Australia concurrent to this investigation.

Further assessment and remediation may be required to address the hydrocarbon impacts in the mobile plant refuelling area (AEC ME). It is possible that costs related to this work could exceed the material threshold. As further assessment of the source of the LNAPL, and further delineation of the extent of contamination is required, detailed costings for remediation have not been prepared based the current data.

The costs associated with the management and/or remediation of this issue have been estimated in the range of \$M 0.3 - \$M 0.8 based on ERM's professional judgement and experience of similar hydrocarbon issues on large industrial sites.

It is recommended that the grit blasting impacts in the former contractors yard (Area ML) to the south of the workshop building be removed from this area as part of general housekeeping. The costs associated with this issue are not anticipated to be material.

As discussed in *Section 5.6.3*, the exceedences of the adopted screening values for metals in groundwater would most likely continue to be managed by NSW EPA under the *POEO Act (1997)* via the Site EPL. Therefore, ERM considers that the costs associated with this issue are not anticipated to be material.

The data presented in the ESA was considered to generally be of a suitable quality and completeness to meet the objectives as stated in *Section 1.2*, including to inform future decisions on the management of contamination issues. It is noted that the costs associated with the management and/or remediation of the identified contamination issues described above are indicative and that further assessment may be required to delineate the extent of contamination which may require management and/or remediation.

#### 5.7.5

#### ***Summary - Is The Data Suitable To Provide A Baseline Of Environmental Conditions At The Site And Immediate Surrounding Receiving Environments***

The data presented in the ESA was considered to generally be of a suitable quality and completeness to provide a baseline of environmental conditions at the Site as at or near the time of the transaction. It is noted that the majority of the locations proposed in the Preliminary ESA were able to be advanced, with the exception of the locations listed in *Table 3.1*.

It is noted that the vertical boring of soils is not an ideal method via which to identify asbestos impacts in soils. The absence of asbestos within fill materials or upon surface soils in other areas across the Site therefore cannot be guaranteed on the basis of the results of this assessment. Similarly, as with any investigation of this nature, the potential exists for unidentified contamination to exist between the completed sampling locations both within and between AECs.

Additional characterisation of the baseline conditions at the Site is not considered to be required on the basis of the outcomes of this investigation. It is noted that groundwater impacts associated with Underground Petroleum Storage System (UPSS) infrastructure at the Site were identified independently of this assessment and the current site operator (EnergyAustralia) has been developing appropriate management approaches alongside independent consultants and regulators. On the basis of the outcomes of this Phase 2 ESA, it is considered that further monitoring may be required in these areas as follows:

- Groundwater – It is recommended that the integrity of the UST and lines in the vicinity of MJ\_X\_MWMP1 be tested to assess the potential for sub-surface leaks. Additional confirmatory groundwater sampling is also recommended at this location to confirm the measured concentrations of benzene with specific reference to clarification of the duty to report contamination under *Section 60 of the CLM Act (1997)*.
- Groundwater – Additional groundwater monitoring and gauging in AEC ME (Mobile Plant Refuelling Area) is recommended at the cross-gradient locations near ME\_X\_MWMP8, to confirm the delineation of LNAPL prior to reporting of the most recent results to NSW EPA. This may already be scheduled as part of the existing scheduled UPSS monitoring program and/or separate investigations initiated by Energy Australia. It is recommended that the integrity of the oil pit and the adjacent oil-water interceptor in AEC ME is tested to investigate the potential source of LNAPL contamination in this area. It is further recommended that the sewer main and the drainage pipe from the oil-water interceptor be investigated to determine the potential for preferential migration pathways of LNAPL in this area.

**CONCLUSIONS**

ERM completed a Phase 2 ESA at Mt Piper Power Station in order to develop a baseline assessment of environmental conditions at the Site as at or near the time of the transaction. Soil, groundwater, surface water and sediment data were compared against published environmental quality levels to provide a screening level assessment of potential risks to identified human and environmental receptors. The following conclusions were made based on the data collected during the investigation:

- The impacts identified in soil and groundwater at the sites are unlikely to represent a risk to human health and/or the environment given appropriate ongoing management based on the current and continued use of the Site as a Power Station.
- The key impacts identified include hydrocarbons and LNAPL in groundwater in the Mobile Plant Refuelling Area, benzene in groundwater near a UST, and metals in groundwater (refer below).
- Various metals were identified at concentrations in excess of screening values across the Site, however the concentrations of metals in groundwater across the Site are generally comparable to background groundwater quality. Where metals were above background concentrations, impact generally appears to be related to contributions from former mine workings both on the Site and in surrounding areas.
- No contamination issues were identified which would require material management or remediation based on the current and continued use of the Site as a Power Station with the potential exception of the identified hydrocarbon impacts in groundwater in the Mobile Plant Refuelling Area. On the basis of the data available to ERM at the time of this assessment, the potential for vapour inhalation risks to industrial workers and/or intrusive maintenance workers in this area could not be ruled out. However, ERM understands that the current site operator (Energy Australia) (and prior to the transaction Delta Electricity) has been developing appropriate management approaches in relation to this issue alongside independent consultants and regulators. It is noted that Delta Electricity has previously notified this issue to NSW EPA. It is considered that the costs for management of this issue may be potentially material depending on the remediation / management option selected.
- ERM considers that NSW EPA would most likely continue to manage the LNAPL issue under the existing notification of potential contamination under the CLM Act, however, the additional results should be provided to NSW EPA for review and consideration.



- ERM considers that NSW EPA would most likely continue to manage the metals in groundwater issue under the *POEO Act (1997)* via the Site EPL (including the existing groundwater and surface water monitoring and reporting required as part of the conditions of consent issued under the *EP&A Act*), and hence would not require formal notification under the *CLM Act (1997)*, however this approach should be confirmed with NSW EPA to ensure strict adherence to the *NSW DECC (2009)* guidelines. It is noted that NSW EPA could potentially request some modifications to the existing groundwater and surface water monitoring program under the EPL.
- The data presented in this Phase 2 ESA was generally considered to be of a suitable quality and completeness to provide a baseline of environmental conditions at the Site and immediate surrounding receiving environments. It is noted that groundwater impacts identified independently of this assessment and the current site operator (EnergyAustralia) has been developing appropriate management approaches alongside independent consultants and regulators. On the basis of the outcomes of this Phase 2 ESA, it is considered that further monitoring may be required in these areas as follows:
  - Groundwater – It is recommended that the integrity of the UST and lines in the vicinity of MJ\_X\_MWMP1 be tested to confirm the absence of sub-surface leaks. Additional confirmatory groundwater sampling is also recommended at this location to confirm the measured concentrations of benzene with specific reference to clarification of the duty to report contamination under *Section 60 of the CLM Act (1997)*.
  - Groundwater – Additional groundwater monitoring and gauging in AEC ME is recommended at the cross-gradient locations near ME\_X\_MWMP8, to confirm the delineation of LNAPL prior to reporting to NSW EPA. This may already be scheduled as part of the existing scheduled UPSS monitoring program and/or separate investigations initiated by Energy Australia with SMEC. It is recommended that the integrity of the oil pit and the adjacent oil-water interceptor in AEC ME is tested to investigate the potential source of LNAPL contamination in this area. It is further recommended that the sewer main and the drainage pipe from the oil-water interceptor be investigated to determine the potential for preferential migration pathways of LNAPL in this area.

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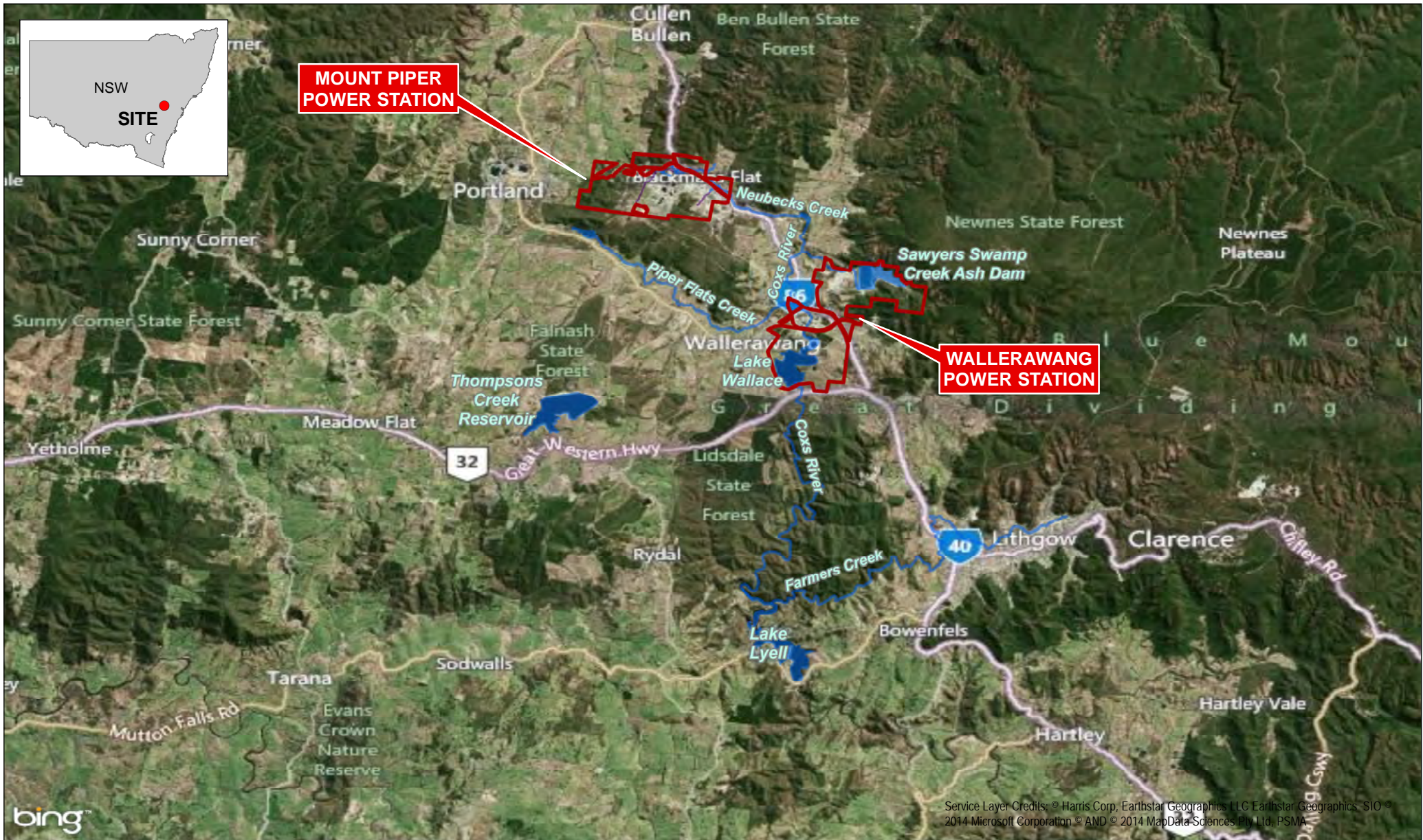
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Annex A

Figures





- Legend
- Approximate Site Boundary
  - Hydrological Features
  - River/Creek
  - Drainage Line

Source:  
bing maps imagery date  
December 2012

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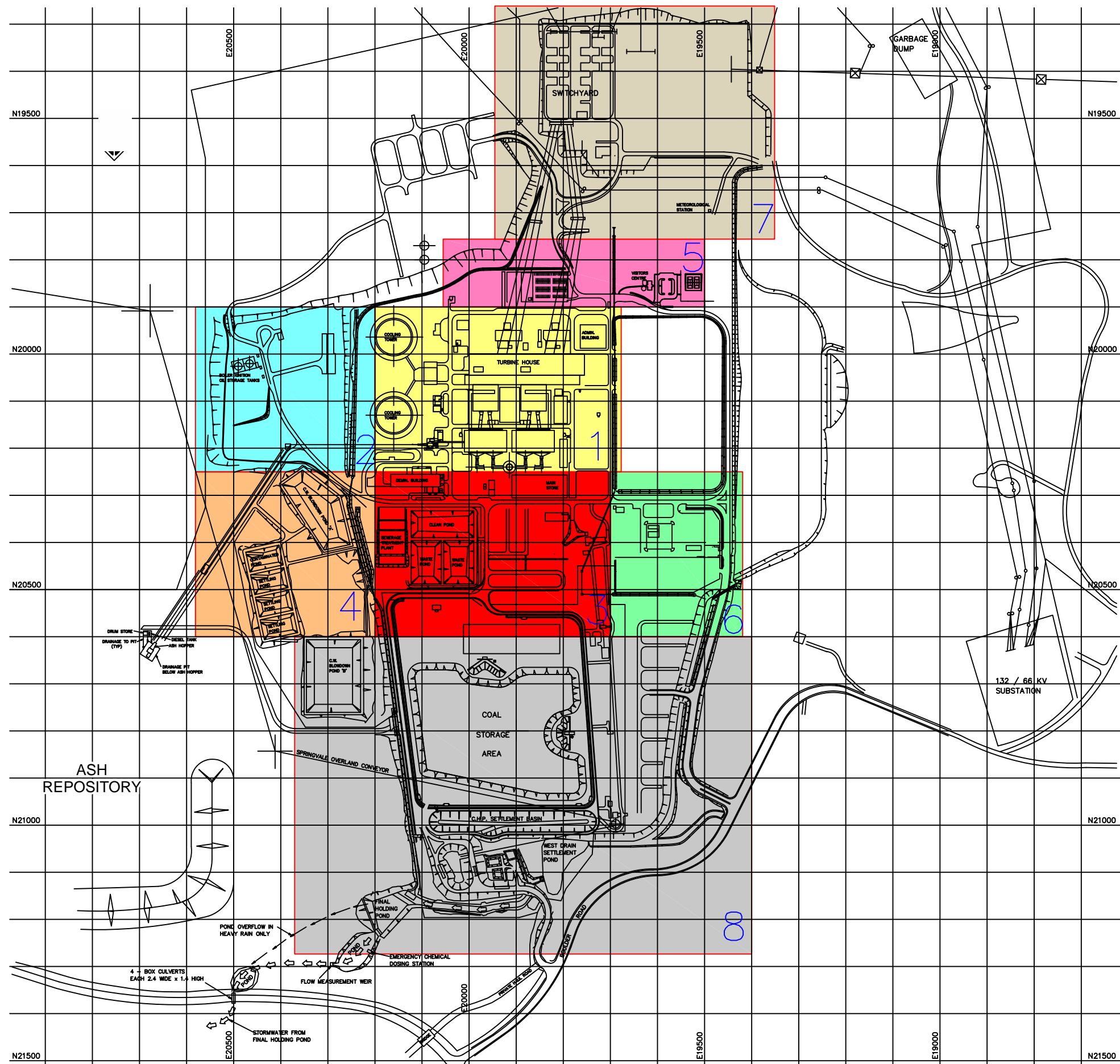
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Drawing No:	0207423s_MP_ST2ESA_G001_R1.mxd
Date:	12/08/2014
Drawn By:	GC
Drawing Size:	A4
Reviewed By:	AA
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<b>Figure 1 - Site Locality</b>
Project Symphony - Mt Piper Stage 2 Environmental Site Assessment
Environmental Resources Management ANZ Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney



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- Legend**
- Area 1: Station Area
  - Area 2: Tank Farm Area
  - Area 3: Demin. Plant, Main Store Area
  - Area 4: Ponds North East Area
  - Area 5: Visitors Centre, Carpark
  - Area 6: Construction Offices Area
  - Area 7: Switchyard Area
  - Area 8: Coal Handling Plant Area

Source:  
Delta Electricity, 2004.  
Drawing No.: PM637562 - 01, 07/07/2004.

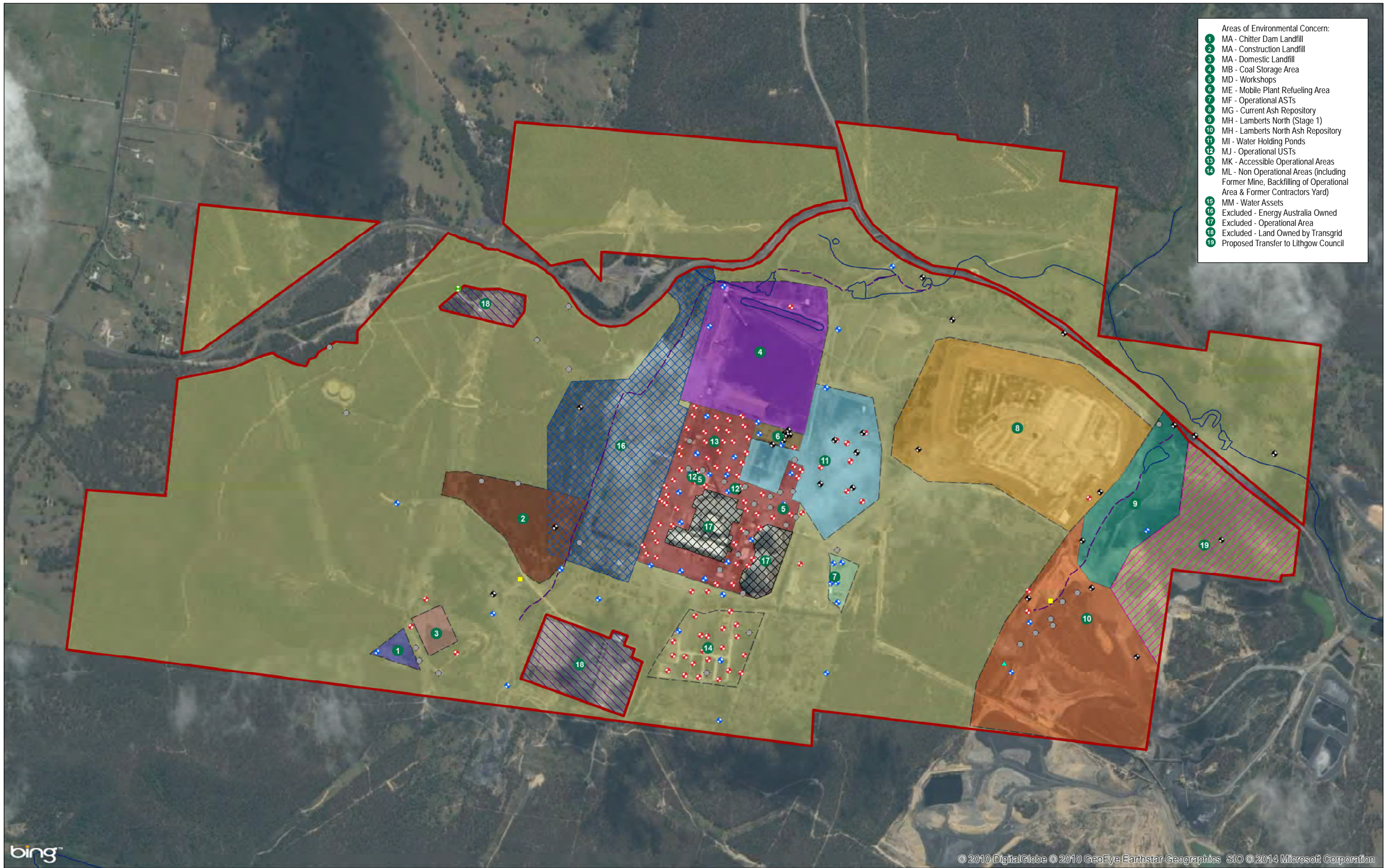


Client: Delta Electricity  
 Drawing No: 0207423s\_MP\_ST2ESA\_C001\_R2.cdr  
 Date: 13/08/2014 Drawing size: A3  
 Drawn by: GC Reviewed by: AA  
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**Figure 2 - Site Layout Plan (Operational Area)**  
 Project Symphony - Mt Piper  
 Stage 2 Environmental Site Assessment  
 Environmental Resources Management ANZ  
 Auckland, Brisbane, Canberra, Christchurch,  
 Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney







- Areas of Environmental Concern:
- 1 MA - Chitter Dam Landfill
  - 2 MA - Construction Landfill
  - 3 MA - Domestic Landfill
  - 4 MB - Coal Storage Area
  - 5 MD - Workshops
  - 6 ME - Mobile Plant Refueling Area
  - 7 MF - Operational ASTs
  - 8 MG - Current Ash Repository
  - 9 MH - Lamberts North (Stage 1)
  - 10 MH - Lamberts North Ash Repository
  - 11 MI - Water Holding Ponds
  - 12 MJ - Operational USTs
  - 13 MK - Accessible Operational Areas
  - 14 ML - Non Operational Areas (including Former Mine, Backfilling of Operational Area & Former Contractors Yard)
  - 15 MM - Water Assets
  - 16 Excluded - Energy Australia Owned
  - 17 Excluded - Operational Area
  - 18 Excluded - Land Owned by Transgrid
  - 19 Proposed Transfer to Lithgow Council

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Legend

- |  |  |   |  |  |
|--|--|---|--|--|
| <ul style="list-style-type: none"> <li>Approximate Site Boundary</li> <li>Hydrological Features</li> <li>Drainage Line</li> <li>River/Creek</li> </ul> | <ul style="list-style-type: none"> <li>Excluded - Energy Australia Owned</li> <li>Excluded - Operational</li> <li>Excluded - Transgrid Switchyard</li> <li>Proposed Transfer to Lithgow Council</li> </ul> | <ul style="list-style-type: none"> <li>Abandoned Monitoring Well</li> <li>Existing Monitoring Well</li> <li>Monitoring Well</li> <li>Soil Bore</li> </ul> | <ul style="list-style-type: none"> <li>Sediment Sample</li> <li>Surface Soil Sample</li> <li>Surface Water Sample</li> </ul> | <p>AECs:</p> <ul style="list-style-type: none"> <li>MA - Chitter Dam Landfill</li> <li>MA - Construction Landfill</li> <li>MA - Domestic Landfill</li> <li>MB - Coal Storage</li> <li>MD - Workshops</li> <li>ME - Mobile Plant Refueling Area</li> <li>MH - Lamberts North (Stage 1)</li> <li>MH - Lamberts North Ash Repository</li> <li>MI - Water Holding Ponds</li> <li>MG - Current Ash</li> <li>MH - Lamberts North (Stage 1)</li> <li>MH - Lamberts North Ash Repository</li> <li>MI - Water Holding Ponds</li> <li>MK - Accessible Operational Areas</li> <li>ML - Non Operational</li> </ul> |
|--|--|---|--|--|

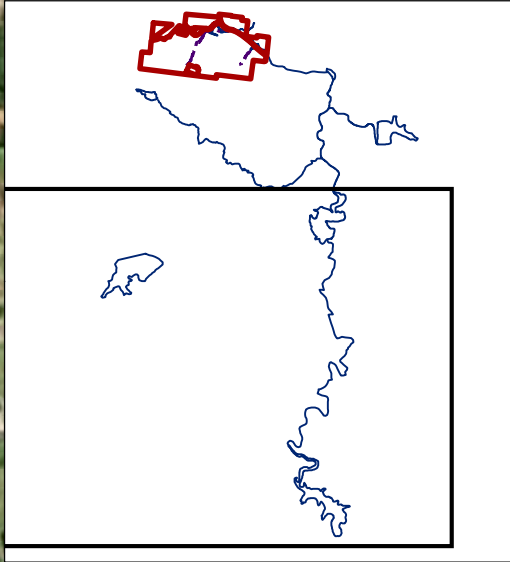
Source:  
bing maps imagery date  
December 2012

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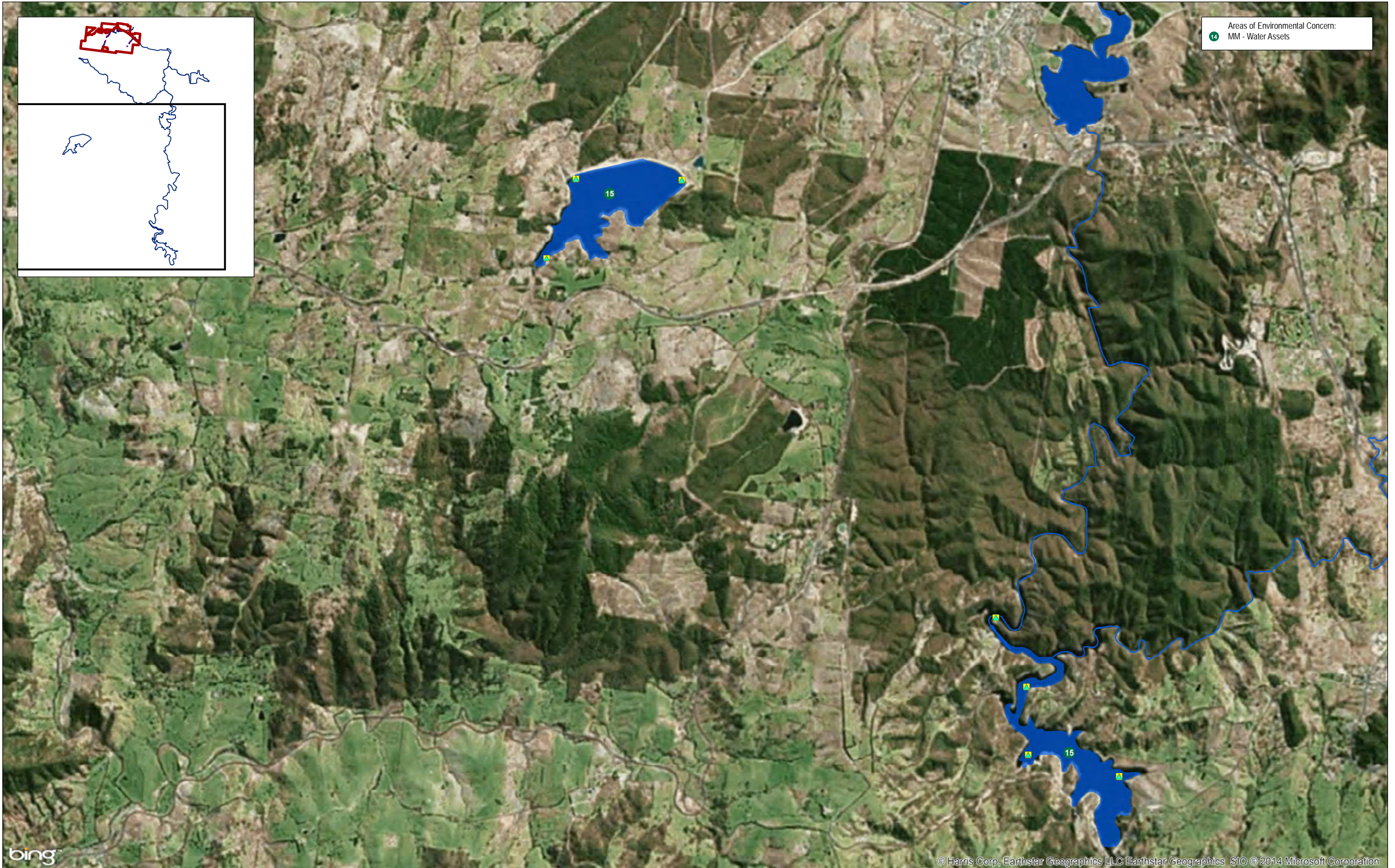


Client: Delta Electricity	<p><b>Figure 3.1 - Areas of Environmental Concern</b></p> <p>Project Symphony - Mt Piper Stage 2 Environmental Site Assessment</p> <p>Environmental Resources Management ANZ Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney</p>
Drawing No: 0207423s_MP_ST2ESA_G002_R1.mxd	
Date: 12/08/2014	
Drawn By: GC	
Reviewed By: AA	<p>This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.</p>





14 Areas of Environmental Concern:  
MM - Water Assets




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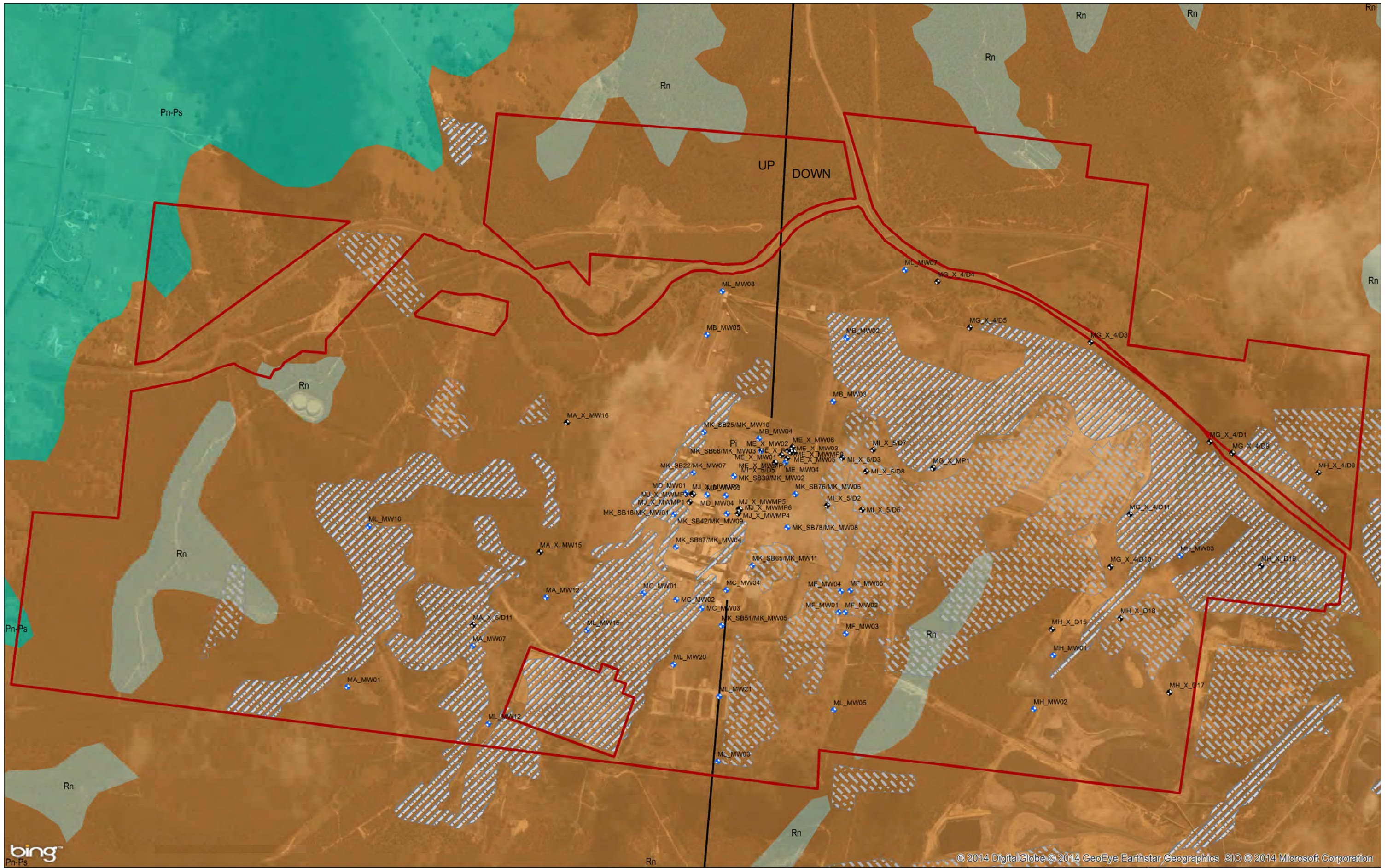
- Legend
- Approximate Site Boundary
  - Hydrological Features
  - River/Creek
  - ▲ Surface Water Sample
  - ▲ Sediment Sample

Source:  
bing maps imagery date  
December 2012



Client: Delta Electricity	<b>Figure 3.2 - Areas of Environmental Concern</b>	Project Symphony - Mt Piper Stage 2 Environmental Site Assessment Environmental Resources Management ANZ Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney
Drawing No: 0207423s_MP_ST2ESA_G003_R1.mxd		
Date: 12/08/2014 Drawing Size: A3		
Drawn By: GC Reviewed By: AA		
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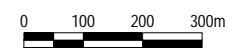
**Legend**

- Approximate Site
- ◆ Existing Monitoring Well
- ♦ Monitoring Well
- Geology:**
- Rn - Narrabeen Group
- Pi - Illawarra Coal Measures
- Pn-Ps - Nile Subgroup (of the Illawarra Coal Measures) and Shoalhaven Group
- Fault
- Former Mine Footprints:**
- Open Cut Mine Workings
- Underground Mine Workings (Pillar and Tunnels)

Geology - Yoo, E.K. 1992. Western Coalfield Regional Geology (southern part) 1:100 000. 1st edition s.l.: Geological Survey of New South Wales, Sydney, 1992. Former mine footprints - PPK

Environment & Infrastructure Pty Ltd (2000), Phase 1 Environmental Assessment, Uncontrolled Landfill Sites, Mt Piper Power Station, Portland NSW, 2000.

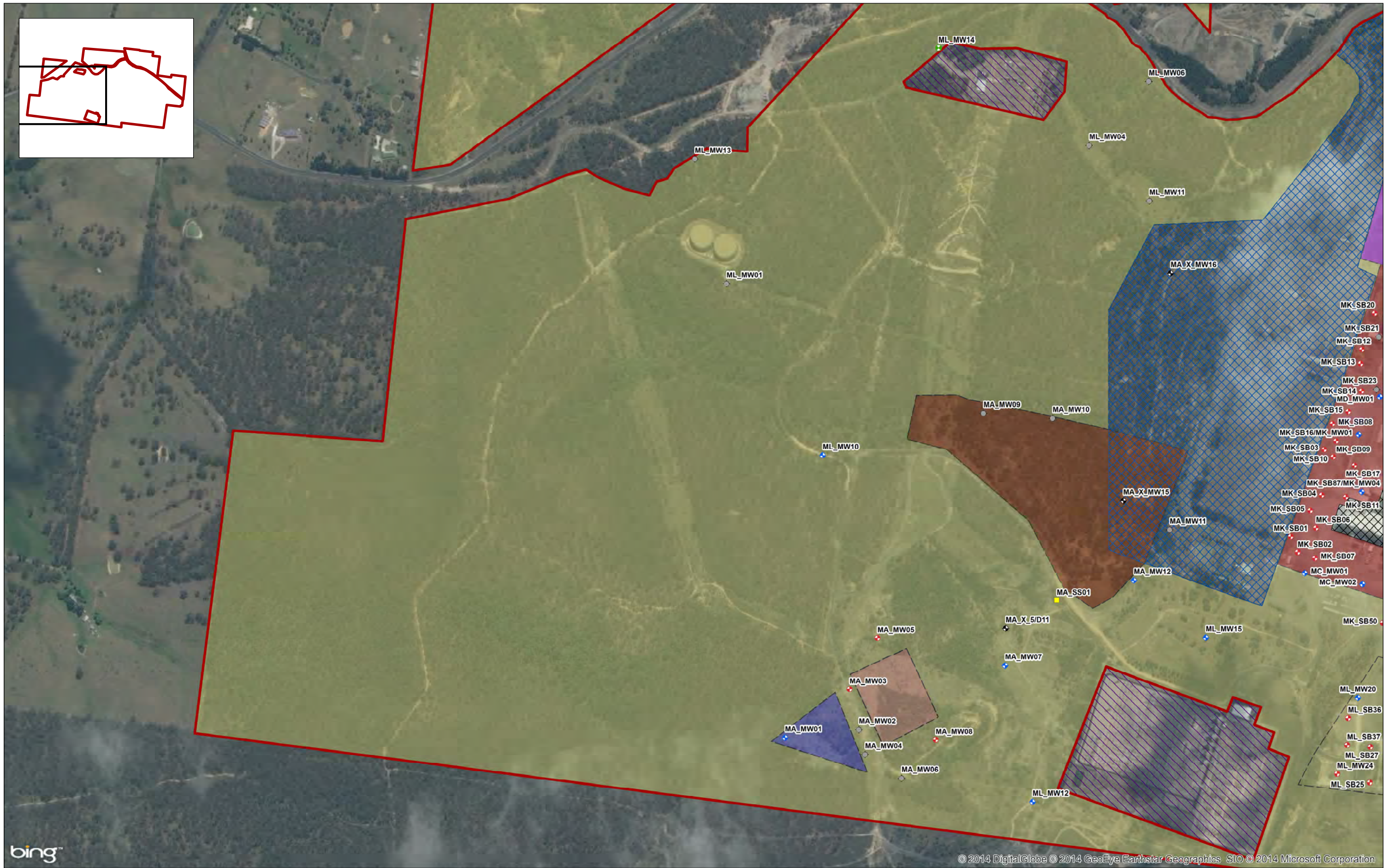
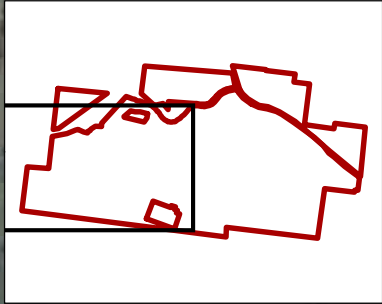
Source:  
bing maps imagery date  
December 2012



Client: Delta Electricity		<b>Figure 4 - Site Geology and Former Mine Footprints</b>
Drawing No: 0207423s_MP_ST2ESA_G004_R1.mxd	Drawing Size: A3	Project Symphomy - Mt Piper
Date: 12/08/2014	Reviewed By: AA	Stage 2 Environmental Site Assessment
Drawn By: GC		Environmental Resources Management ANZ
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- Legend**
- Approximate Site Boundary
  - Excluded - Energy Australia Owned
  - Excluded - Operational Area
  - Excluded - Transgrid Switchyard
  - ◆ Abandoned Monitoring Well
  - ◆ Existing Monitoring Well
  - + Monitoring Well
  - + Soil Bore
  - Sediment Sample
  - + Surface Soil Sample
  - AECs:**
  - MA - Chitter Dam Landfill
  - MA - Construction Landfill
  - MA - Domestic Landfill
  - MB - Coal Storage Area
  - MK - Accessible Operational Areas
  - ML - Non Operational Areas

Source:  
bing maps imagery date  
December 2012

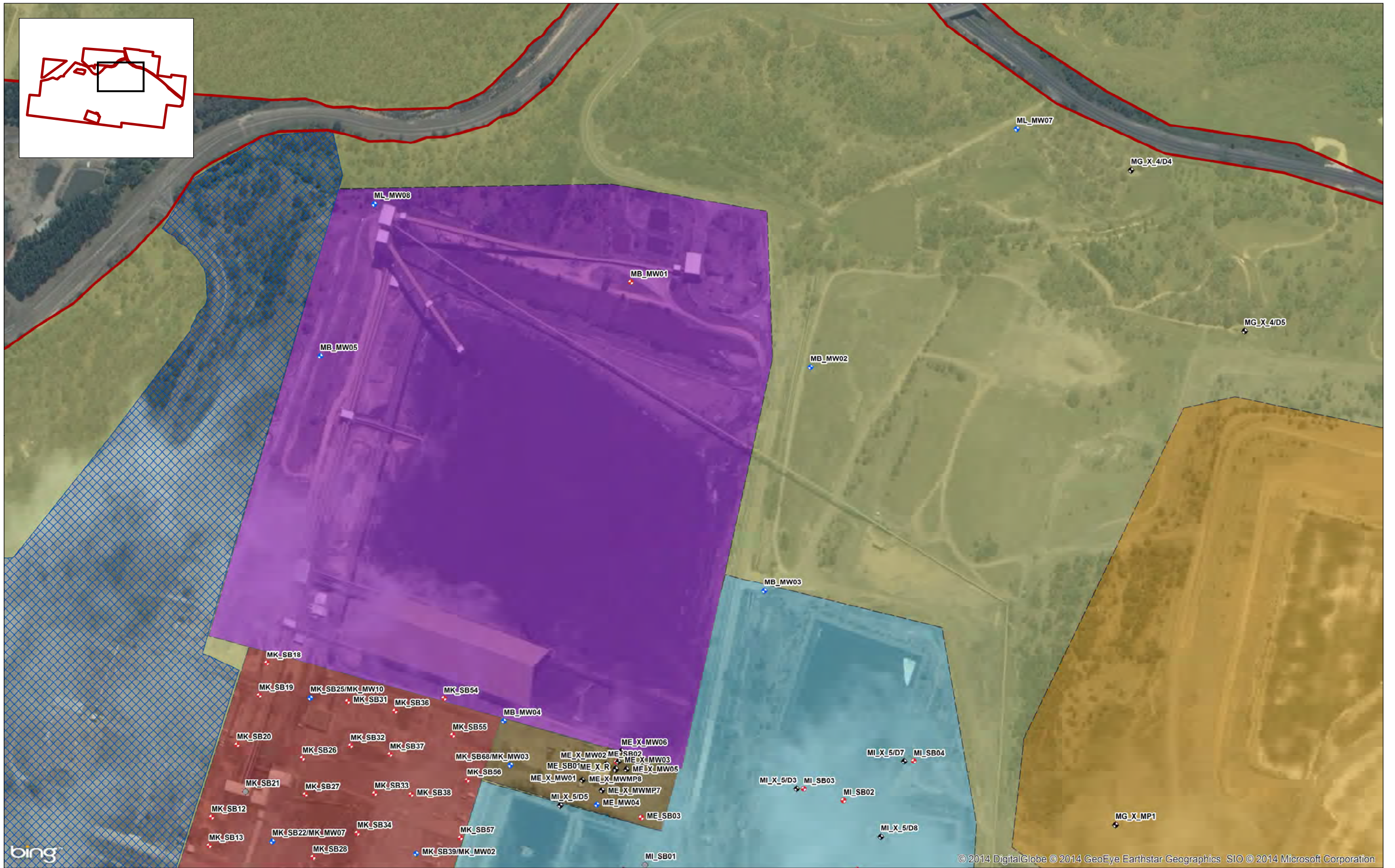


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Client: Delta Electricity	<b>Figure 5.1 - Completed Sampling Locations</b>
Drawing No: 0207423s_MP_ST2ESA_G005_R1.mxd	Project Symphony - Mt Piper
Date: 12/08/2014	Stage 2 Environmental Site Assessment
Drawn By: GC	Reviewed By: AA
Environmental Resources Management ANZ	
Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney	







- Legend**
- Approximate Site Boundary
  - Excluded - Energy Australia Owned
  - ◆ Abandoned Monitoring Well
  - ◆ Existing Monitoring Well
  - ◆ Monitoring Well
  - ◆ Soil Bore
- AECs:**
- MB - Coal Storage Area
  - ME - Mobile Plant Refueling Area
  - MG - Current Ash Repository
  - MI - Water Holding Ponds
  - MK - Accessible Operational Areas
  - ML - Non Operational Areas

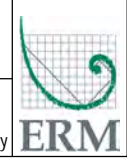
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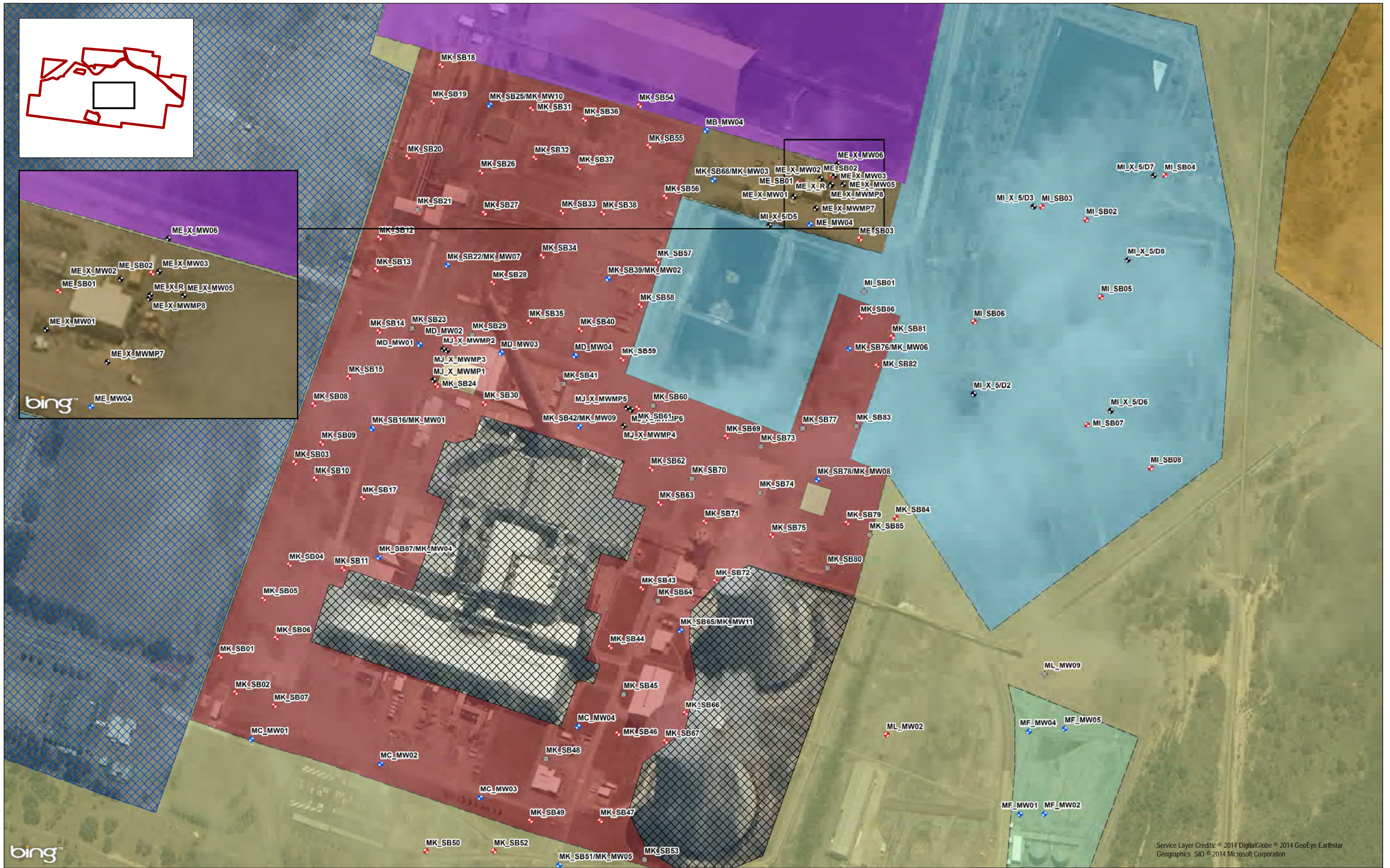
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Client: Delta Electricity	<b>Figure 5.2 - Completed Sampling Locations</b>
Drawing No: 0207423s_MP_ST2ESA_G006_R1.mxd	Project Symphony - Mt Piper
Date: 12/08/2014	Stage 2 Environmental Site Assessment
Drawn By: GC	Reviewed By: AA
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Environmental Resources Management ANZ Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney	







- Legend**
- Approximate Site Boundary
  - Excluded - Energy Australia Owned
  - Excluded - Operational
  - ◆ Abandoned Monitoring Well
  - ◆ Existing Monitoring Well
  - ◆ Monitoring Well
  - Soil Bore
  - AECs:**
  - MB - Coal Storage
  - MG - Current Ash
  - MI - Water Holding Ponds
  - MD - Workshops
  - MK - Accessible Operational Areas
  - ME - Mobile Plant Refueling Area
  - ML - Non Operational
  - MF - Operational

Source:  
bing maps imagery date  
December 2012

0 20 40 60m



Client:	Delta Electricity
Drawing No:	0207423s_MP_ST2ESA_G007_R1.mxd
Date:	12/08/2014
Drawn By:	GC
Reviewed By:	AA

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**Figure 5.3 - Completed Sampling Locations**

Project Symphony - Mt Piper  
Stage 2 Environmental Site Assessment  
Environmental Resources Management ANZ  
Auckland, Brisbane, Canberra, Christchurch,  
Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney



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- Legend**
- Approximate Site Boundary
  - Excluded - Energy Australia Owned
  - Excluded - Operational Area
  - Excluded - Transgrid Switchyard
  - ◆ Abandoned Monitoring Well
  - ◆ Monitoring Well
  - ◆ Soil Bore
  - AECs:**
  - MA - Construction Landfill
  - MF - Operational ASTs
  - MI - Water Holding Ponds
  - MK - Accessible Operational Areas
  - ML - Non Operational Areas

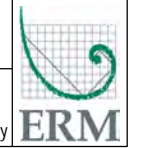
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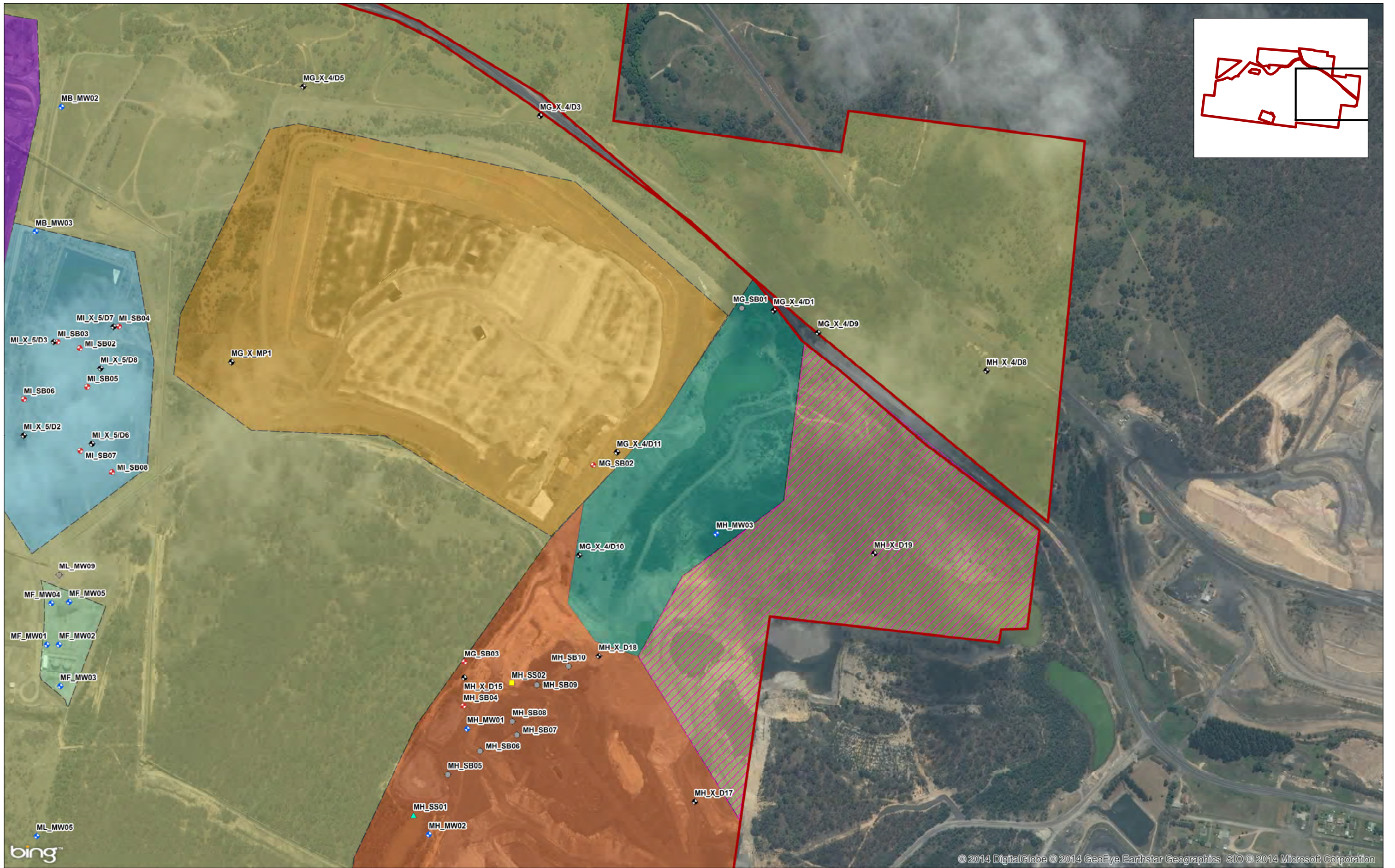


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Client: Delta Electricity	<b>Figure 5.4 - Completed Sampling Locations</b>
Drawing No: 0207423s_MP_ST2ESA_G008_R1.mxd	
Date: 12/08/2014	Drawing Size: A3
Drawn By: GC	Reviewed By: AA
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<b>Project Symphony - Mt Piper</b> Stage 2 Environmental Site Assessment Environmental Resources Management ANZ Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney	

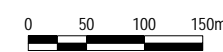






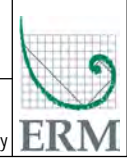
- Legend**
- Approximate Site Boundary
  - Proposed Transfer to Lithgow Council
  - ◆ Monitoring Well
  - ◆ Soil Bore
  - ◆ Sediment Sample
  - ◆ Abandoned Monitoring Well
  - ◆ Existing Monitoring Well
- AECs:**
- MB - Coal Storage Area
  - MF - Operational
  - MG - Current Ash Repository
  - MH - Lamberts North (Stage 1)
  - MI - Water Holding Ponds
  - ML - Non Operational Areas
  - MH - Lamberts North Ash Repository

Source:  
bing maps imagery date  
December 2012

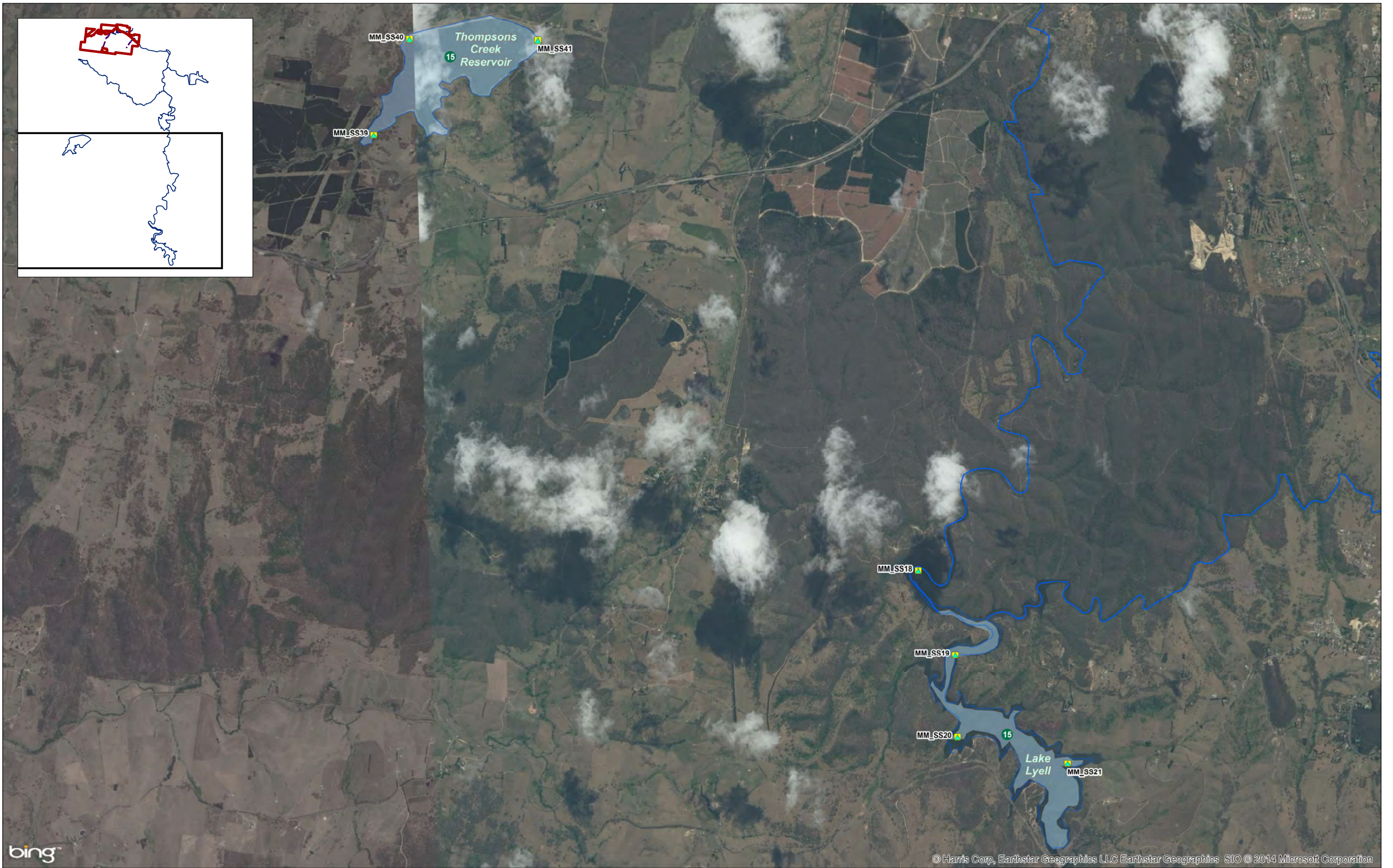
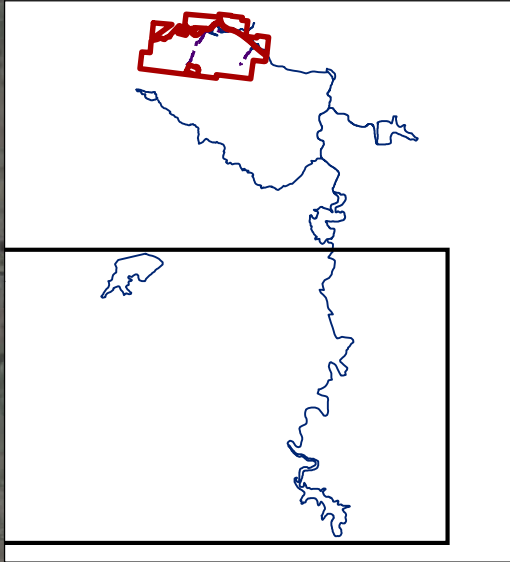


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Client: Delta Electricity	<b>Figure 5.5 - Completed Sampling Locations</b>
Drawing No: 0207423s_MP_ST2ESA_G009_R1.mxd	Project Symphony - Mt Piper
Date: 12/08/2014	Stage 2 Environmental Site Assessment
Drawn By: GC	Reviewed By: AA
Environmental Resources Management ANZ	
Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney	







- Legend**
- Approximate Site Boundary
  - Hydrological Features
  - River/Creek
  - ▲ Surface Water Sample
  - ▲ Sediment Sample
- AECs:**
- MM - Water Assets

Source:  
bing maps imagery date  
December 2012

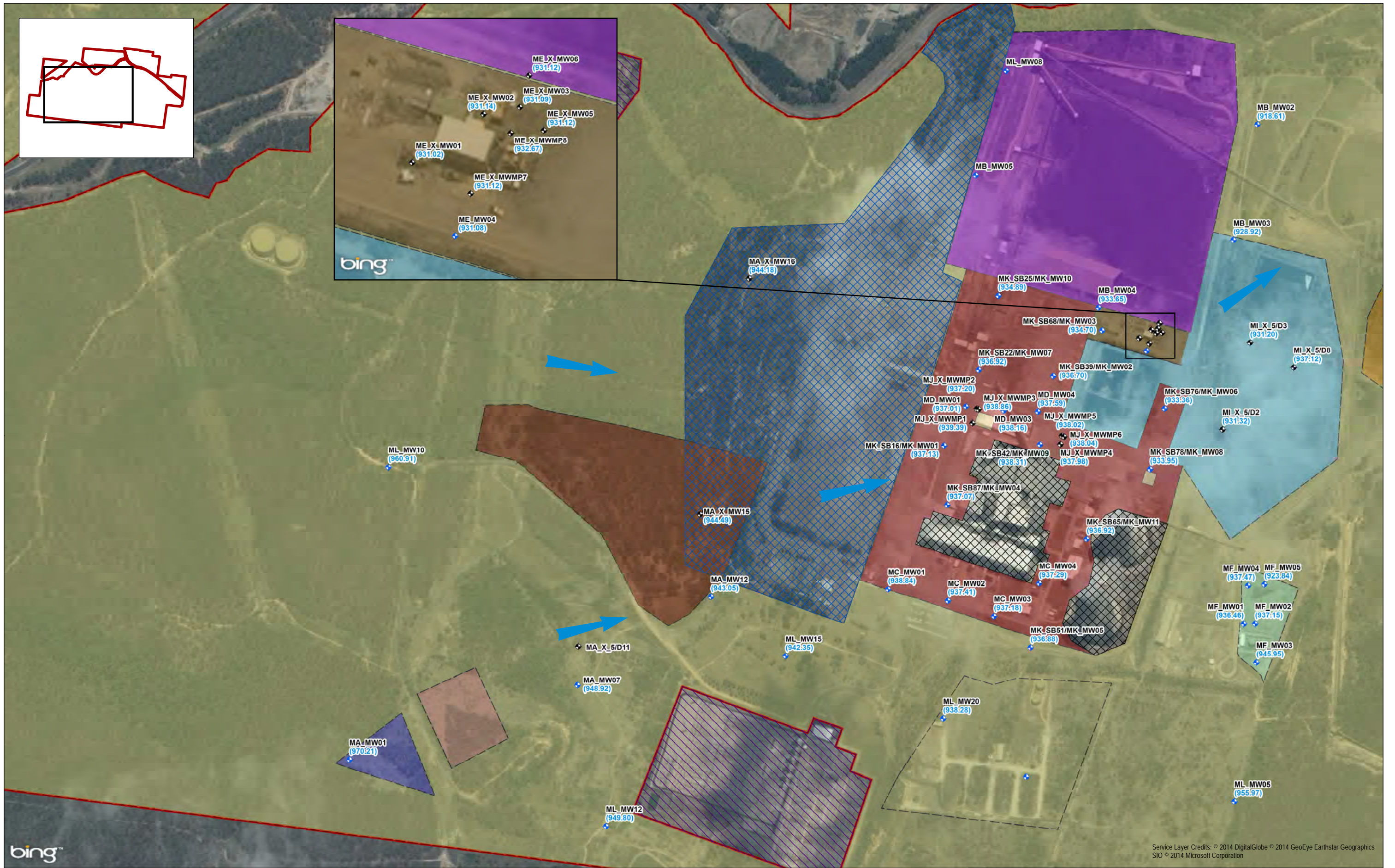


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Client: Delta Electricity	<b>Figure 5.6 - Completed Sampling Locations</b>
Drawing No: 0207423s_MP_ST2ESA_G011_R1.mxd	
Date: 12/08/2014 Drawing Size: A3	
Drawn By: GC Reviewed By: AA	Project Symphony - Mt Piper Stage 2 Environmental Site Assessment Environmental Resources Management ANZ Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney
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**Legend**

- |                                      |                            |                                    |   |  |
|--------------------------------------|----------------------------|------------------------------------|---|--|
| Approximate Site Boundary            | Monitoring Well            | MD - Workshops                     | MI - Water Holding Ponds                | (948.80) Corrected Groundwater Elevation (m AHD) |
| Excluded - Energy Australia Owned    | MA - Chilter Dam Landfill  | ME - Mobile Plant Refueling Area   | MK - Accessible Operational Areas       | Inferred Groundwater Flow Direction              |
| Excluded - Operational Area          | MA - Construction Landfill | MF - Operational ASTs              | ML - Non Operational Areas              |  |
| Excluded - Transgrid Switchyard      | MA - Domestic Landfill     | MG - Current Ash Repository        | MM - Water Assets (Lake Lyell)          |  |
| Proposed Transfer to Lithgow Council | MB - Coal Storage Area     | MH - Lamberts North (Stage 1)      | MM - Water Assets (Thompsons Reservoir) |  |
| Existing Monitoring Well             |                            | MH - Lamberts North Ash Repository |   |  |

Notes:  
SWL in several monitoring wells were considered outliers due to former mine workings and geological features.

Source:  
bing maps imagery date  
December 2012



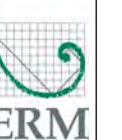
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Drawing No:	0207423s_MP_ST2ESA_G012_R1.mxd
Date:	12/08/2014
Drawn By:	GC
Reviewed By:	AA

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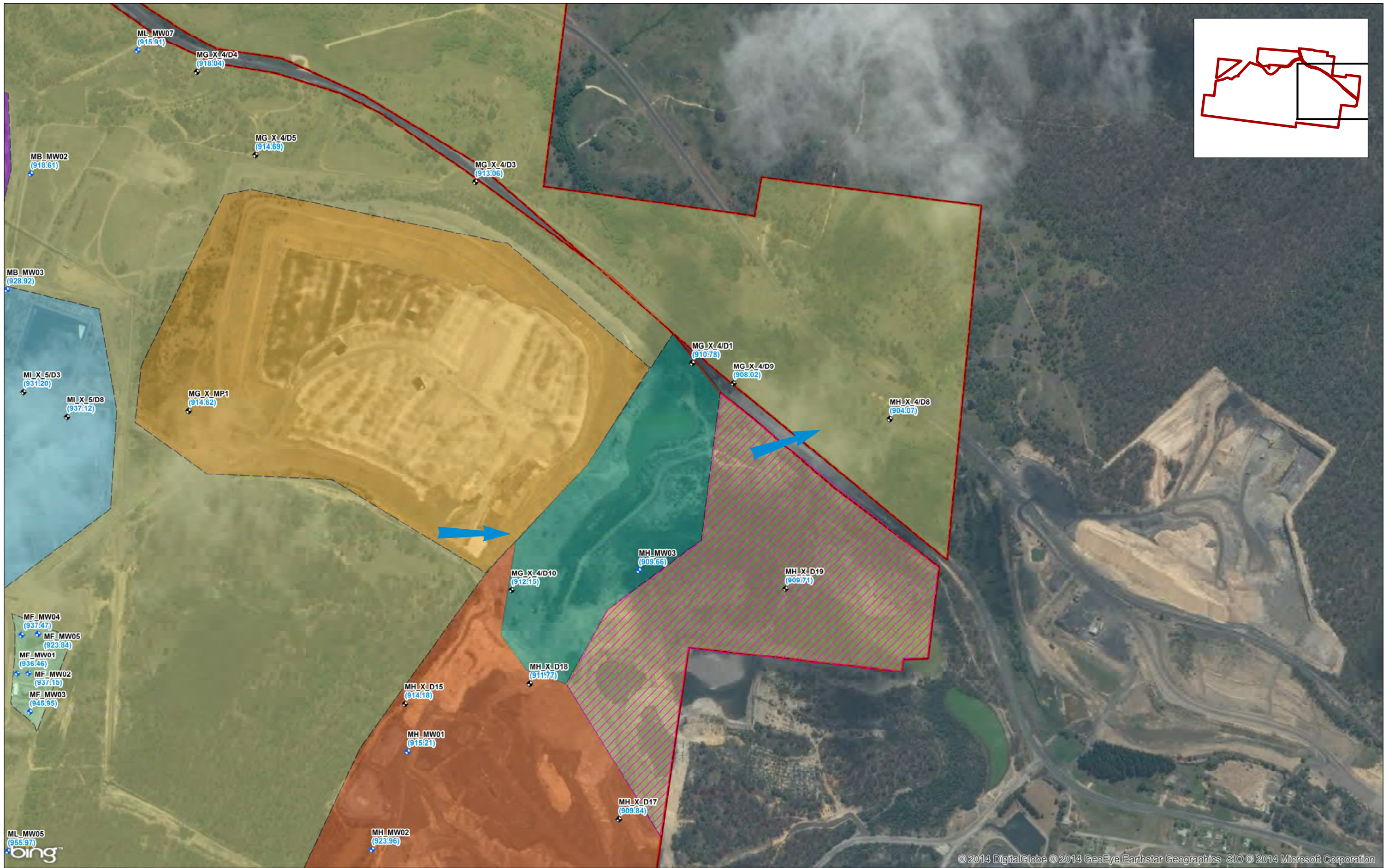
**Figure 6.1 - Groundwater Elevations and Estimated Flow Direction**

Project Symphony - Mt Piper  
Stage 2 Environmental Site Assessment

Environmental Resources Management ANZ  
Auckland, Brisbane, Canberra, Christchurch,  
Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney







Legend	
	Approximate Site Boundary
	Existing Monitoring Well
	Monitoring Well
	MG - Current Ash Repository
	MH - Lamberts North (Stage 1)
	MH - Lamberts North Ash Repository
	MB - Coal Storage Area
	MI - Water Holding Ponds
	MF - Operational ASTs
	ML - Non Operational Areas
	Inferred Groundwater Flow Direction
	(948.80) Corrected Groundwater Elevation (m AHD)

Source:  
bing maps imagery date  
December 2012

0 50 100 150m

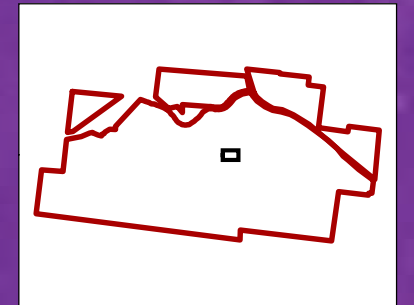


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Client: Delta Electricity	<b>Figure 6.2 - Groundwater Elevations and Estimated Flow Direction</b>
Drawing No: 0207423s_MP_ST2ESA_G013_R1.mxd	Project Symphony - Mt Piper
Date: 12/08/2014 Drawing Size: A3	Stage 2 Environmental Site Assessment
Drawn By: GC Reviewed By: AA	Environmental Resources Management ANZ
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Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney	







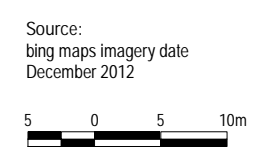
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- Legend**
- Approximate Site Boundary
  - Excluded - Energy Australia Owned
  - Excluded - Operational Area
  - Excluded - Transgrid Switchyard
  - Proposed Transfer to Lithgow Council
  - ◆ Existing Monitoring Well
  - ◆ Monitoring Well
  - AECs:**
  - MB - Coal Storage Area
  - ME - Mobile Plant Refueling Area
  - MI - Water Holding Ponds
  - MK - Accessible Operational Areas
  - ML - Non Operational Areas

- (948.80) Corrected Groundwater Elevation (m AHD)
- Inferred Groundwater Flow Direction (Site Wide)
- Inferred Groundwater Flow Direction (Localised)
- Groundwater Elevation Contours (m AHD)
- 0.02 LNAPL Detected (Thickness in metres)

Notes:  
Monitoring wells were not all gauged on the same day.



Client:	Delta Electricity
Drawing No:	0207423s_MP_ST2ESA_G014_R1.mxd
Date:	12/08/2014
Drawn By:	GC
Reviewed By:	AA

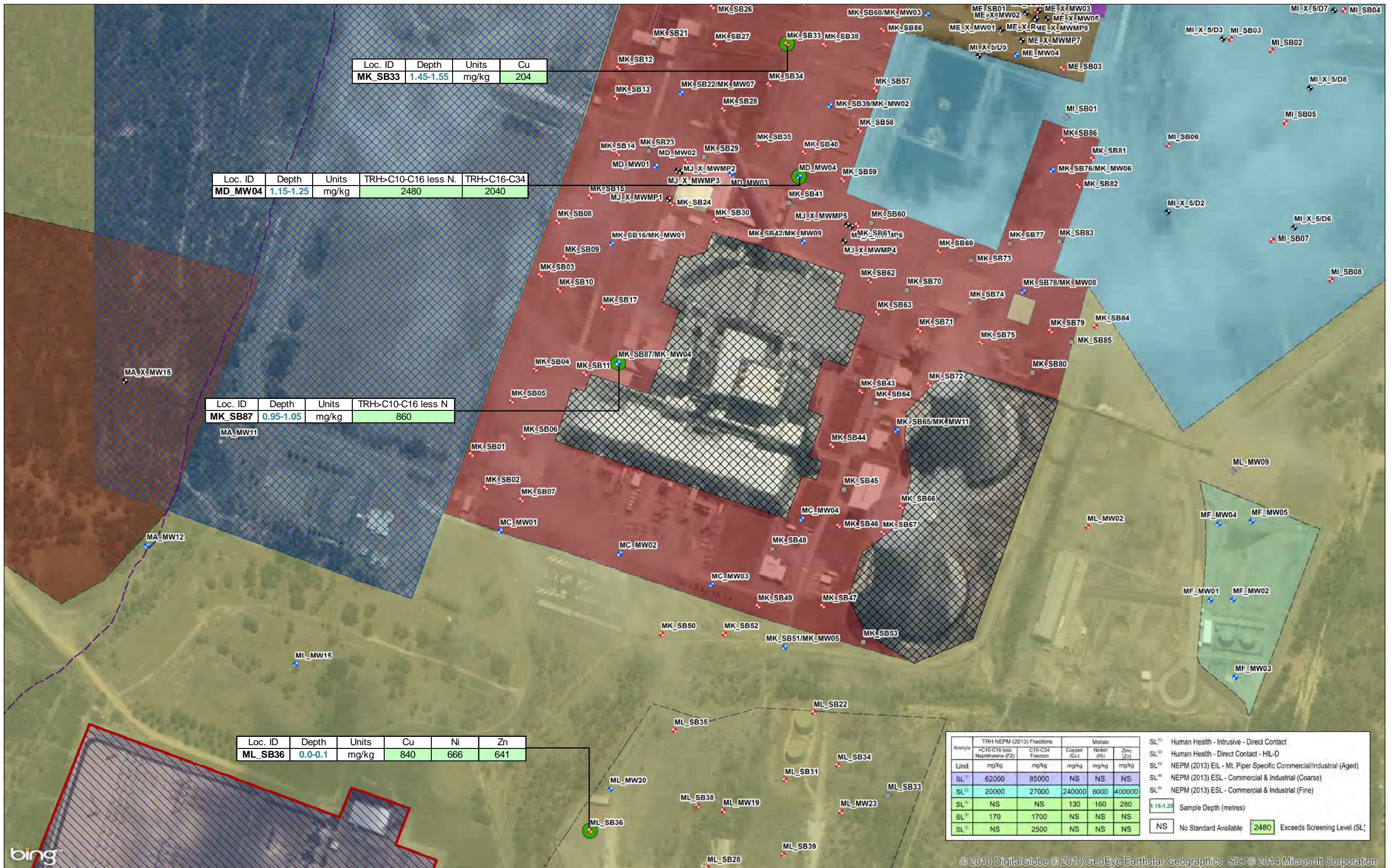
**Figure 6.3 - Groundwater Elevations and Estimated Flow Direction**

Project Symphony - Mt Piper  
Stage 2 Environmental Site Assessment

Environmental Resources Management ANZ  
Auckland, Brisbane, Canberra, Christchurch,  
Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney







- Legend**
- Approximate Site Boundary
  - Drainage Line
  - Excluded - Energy Australia Owned
  - Excluded - Operational
  - Excluded - Transgrid Switchyard
  - ◆ Abandoned Monitoring Well
  - ◆ Existing Monitoring Well
  - + Monitoring Well
  - Soil Bore
  - Soil Exceedance
- AECs:**
- MA - Construction Landfill
  - MB - Coal Storage
  - MD - Workshops
  - ME - Mobile Plant Refueling Area
  - MF - Operational
  - MI - Water Holding Ponds
  - MK - Accessible Operational Areas
  - ML - Non Operational

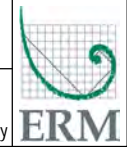
Source: bing maps imagery date December 2012

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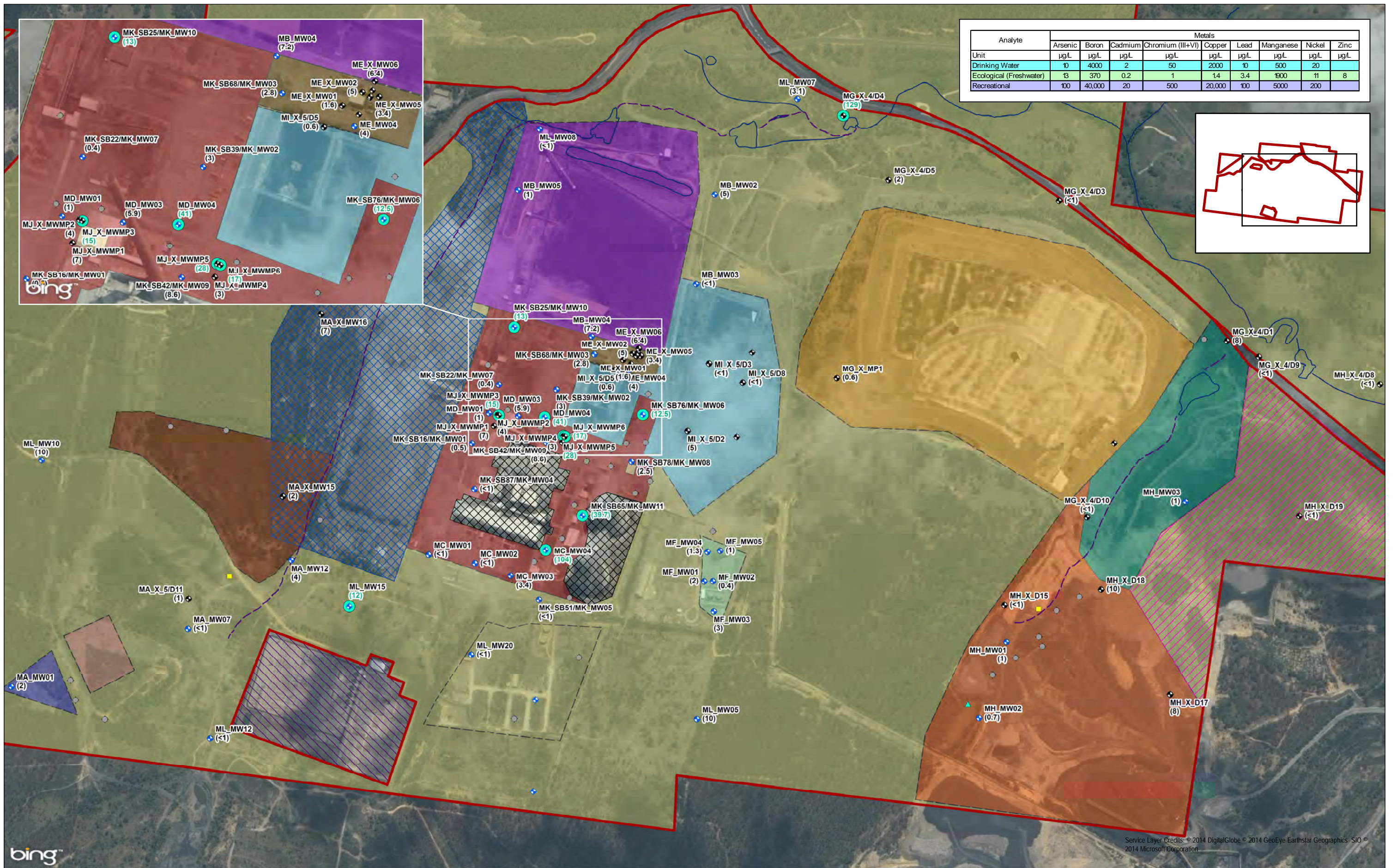
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Client: Delta Electricity	<b>Figure 7 - Soil Exceedances and Analytical Results</b>
Drawing No: 0207423s_MP_ST2ESA_G015_R1.mxd	
Date: 12/08/2014 Drawing Size: A3	
Drawn By: GC Reviewed By: AA	

Project Symphony - Mt Piper  
 Stage 2 Environmental Site Assessment  
 Environmental Resources Management ANZ  
 Auckland, Brisbane, Canberra, Christchurch,  
 Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney







**Legend**

- Approximate Site Boundary
- Hydrological Features
- Drainage Line
- River/Creek
- Excluded - Energy Australia Owned
- Excluded - Operational Area
- Excluded - Transgrid Switchyard
- Proposed Transfer to Lithgow Council

**AECs:**

- MA - Chitter Dam Landfill
- MA - Construction Landfill
- MA - Domestic Landfill
- MB - Coal Storage Area
- MD - Workshops
- ME - Mobile Plant Refueling Area
- MF - Operational ASTs
- MG - Current Ash Repository
- MH - Lamberts North (Stage 1)
- ML - Non Operational Areas

- ◆ Abandoned Monitoring Well
- ◆ Existing Monitoring Well
- ◆ Monitoring Well
- ◆ Sediment Sample
- ◆ Surface Soil Sample
- ◆ Surface Water Sample
- ◆ Exceedance of Screening Level
- ◆ Reported Arsenic Concentration in Groundwater Exceeding at Least One Screening Level

Client: Delta Electricity  
 Drawing No: 0207423s\_MP\_ST2ESA\_G016\_R1.mxd  
 Date: 13/08/2014 Drawing Size: A3  
 Drawn By: GC Reviewed By: AA

**Figure 8.1 - Groundwater Exceedances - Metals (Arsenic)**

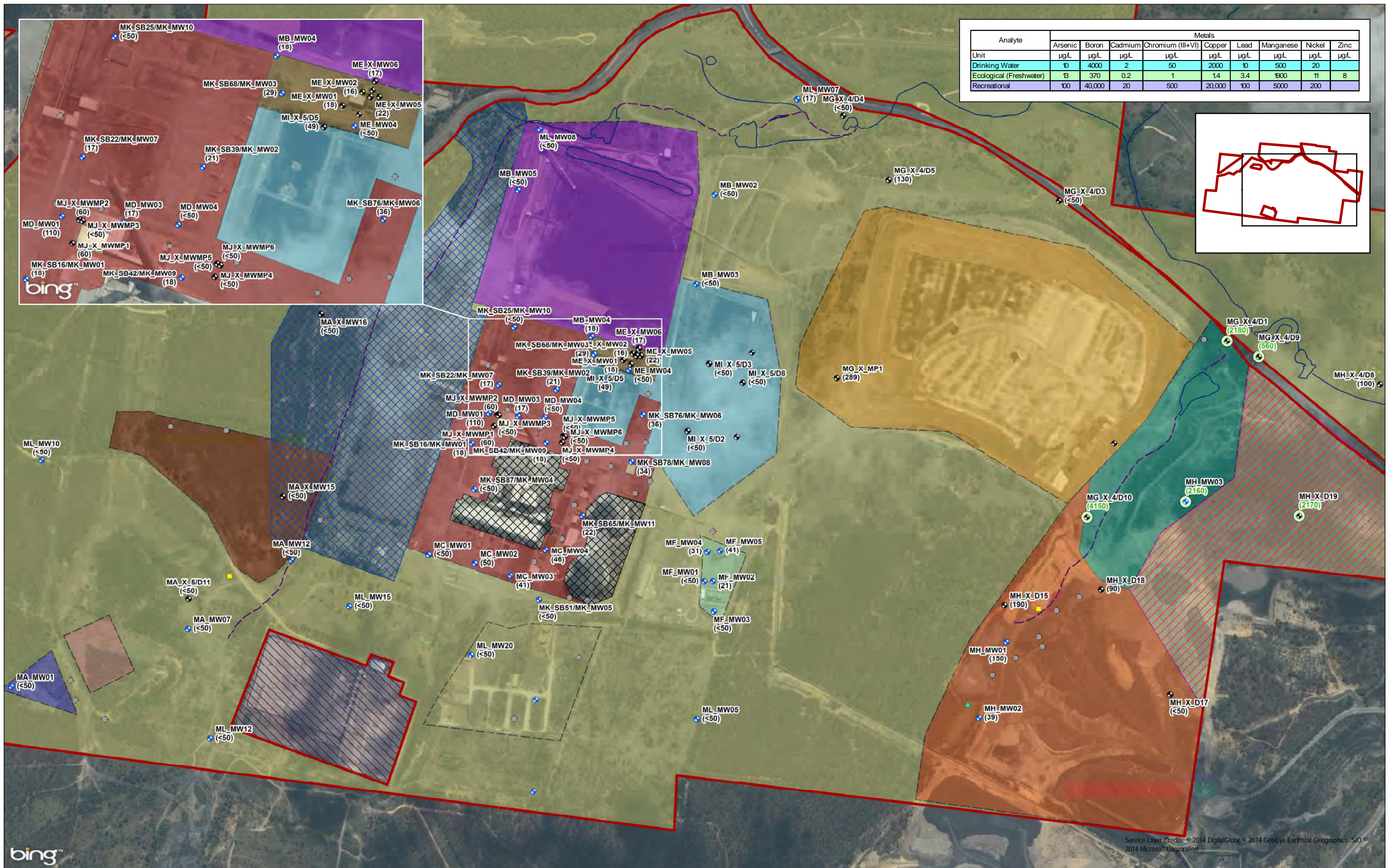
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 Environmental Resources Management ANZ  
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Source: bing maps imagery date December 2012

0 50 100 150m

N





**Legend**

- Approximate Site Boundary
- Hydrological Features
- Drainage Line
- River/Creek
- Excluded - Energy Australia Owned
- Excluded - Operational Area
- Excluded - Transgrid Switchyard
- Proposed Transfer to Lithgow Council
- Abandoned Monitoring Well
- Existing Monitoring Well
- Monitoring Well
- Sediment Sample
- Surface Soil Sample
- Surface Water Sample
- AECs:
  - MA - Chitter Dam Landfill
  - MA - Construction Landfill
  - MA - Domestic Landfill
  - MB - Coal Storage Area
  - MD - Workshops
  - ME - Mobile Plant Refueling Area
  - MF - Operational ASTs
  - MG - Current Ash Repository
  - MH - Lamberts North (Stage 1)
  - ML - Non Operational Areas
- MH - Lamberts North Ash Repository
- MI - Water Holding Ponds
- MK - Accessible Operational Areas
- ML - Non Operational Areas
- Exceedance of Screening Level
- Reported Boron Concentration in Groundwater Exceeding at Least One Screening Level

Client: Delta Electricity  
 Drawing No: 0207423s\_MP\_ST2ESA\_G017\_R1.mxd  
 Date: 13/08/2014  
 Drawn By: GC  
 Reviewed By: AA

**Figure 8.2 - Groundwater Exceedances - Metals (Boron)**

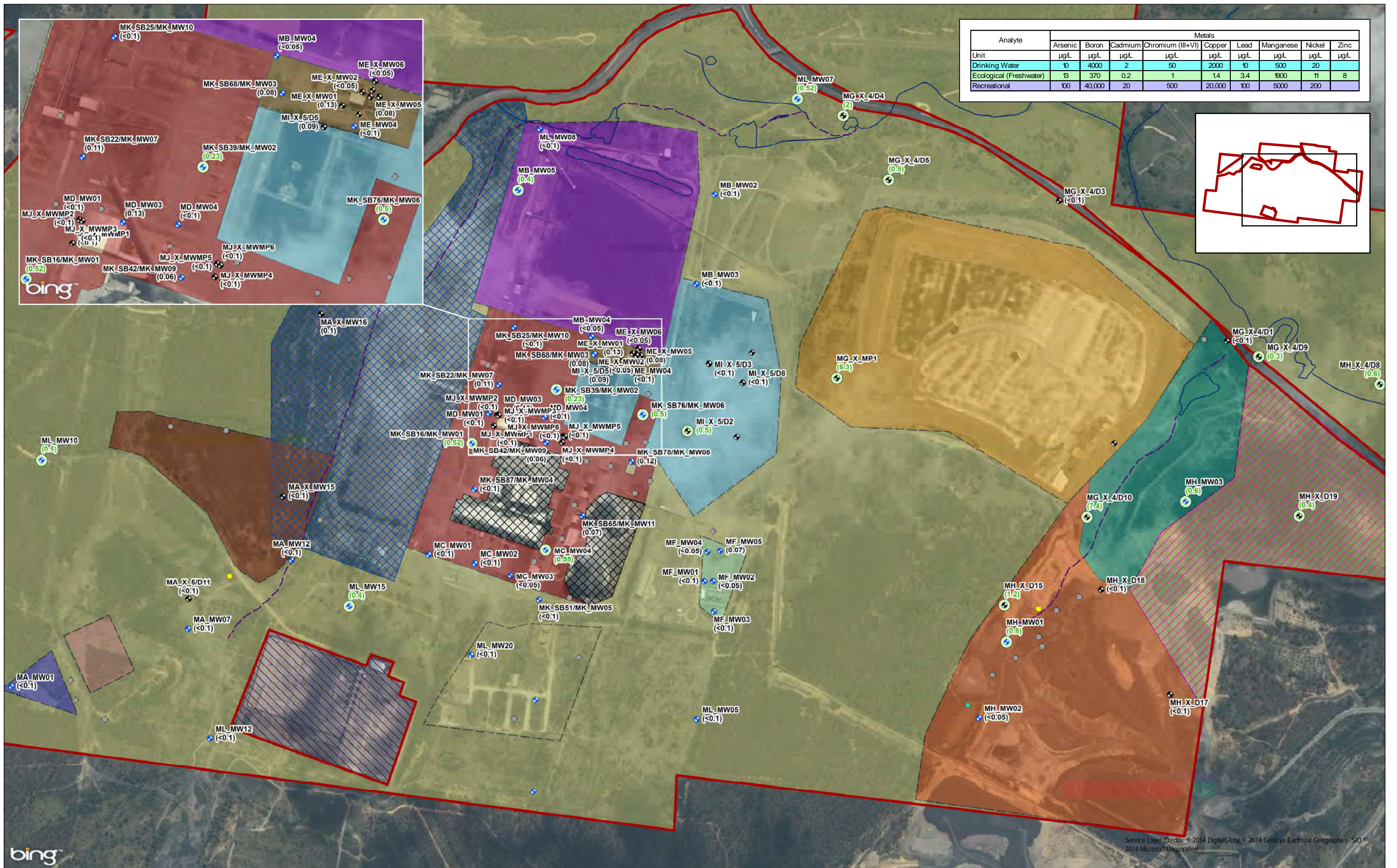
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 Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney

Source: bing maps imagery date December 2012

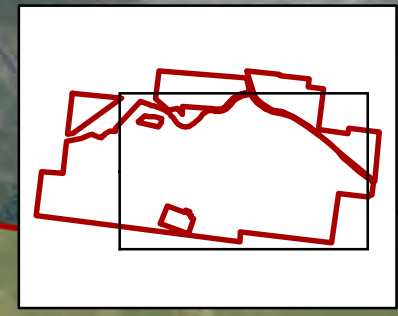
Scale: 0 50 100 150m

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Analyte	Metals								
	Arsenic	Boron	Cadmium	Chromium (III+VI)	Copper	Lead	Manganese	Nickel	Zinc
Drinking Water	10	4000	2	50	2000	10	500	20	100
Ecological (Freshwater)	13	370	0.2	1	1.4	3.4	1900	11	8
Recreational	100	40,000	20	500	20,000	100	5000	200	100



**Legend**

- Approximate Site Boundary
- Hydrological Features
- Drainage Line
- River/Creek
- Excluded - Energy Australia Owned
- Excluded - Operational Area
- Excluded - Transgrid Switchyard
- Proposed Transfer to Lithgow Council

**AECs:**

- MA - Chitter Dam Landfill
- MA - Construction Landfill
- MA - Domestic Landfill
- MB - Coal Storage Area
- MD - Workshops
- ME - Mobile Plant Refueling Area
- MF - Operational ASTs
- MG - Current Ash Repository
- MH - Lamberts North (Stage 1)
- ML - Non Operational Areas

**Monitoring Wells:**

- ◆ Existing Monitoring Well
- ◆ Monitoring Well
- ◆ Sediment Sample
- ◆ Surface Soil Sample
- ▲ Surface Water Sample
- ◆ Abandoned Monitoring Well

**Other:**

- MH - Lamberts North Ash Repository
- MI - Water Holding Ponds
- MK - Accessible Operational Areas

**Figure 8.3 - Groundwater Exceedances - Metals (Cadmium)**

Client: Delta Electricity  
 Drawing No: 0207423s\_MP\_ST2ESA\_G018\_R1.mxd  
 Date: 13/08/2014 Drawing Size: A3  
 Drawn By: GC Reviewed By: AA

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Source: bing maps imagery date December 2012

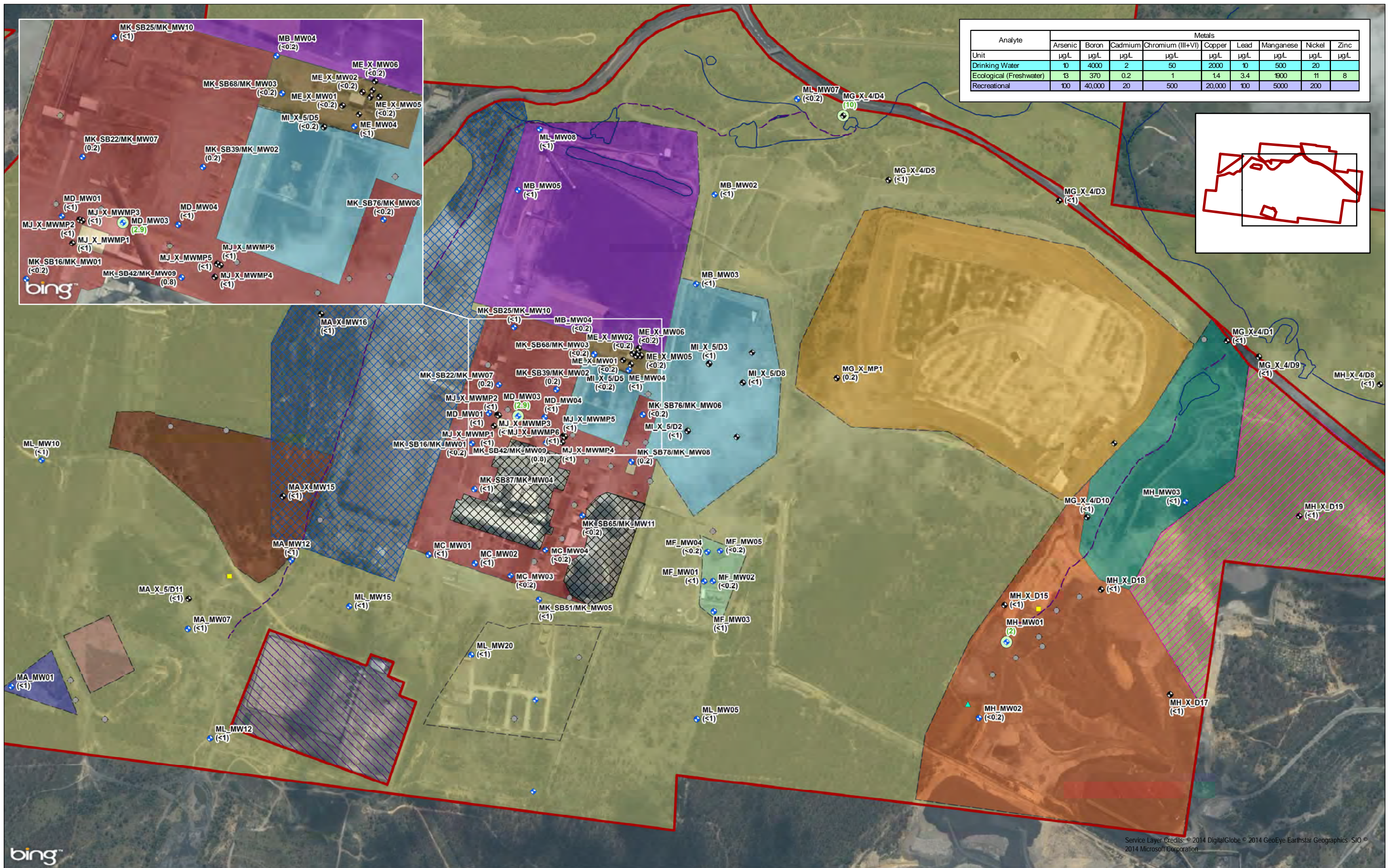
0 50 100 150m

**Reported Cadmium Concentration in Groundwater:**

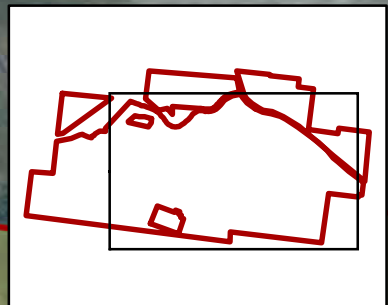
- MH\_MW01 (150) Exceeding at Least One Screening Level
- MH\_MW03 (2160) Exceeding at Least One Screening Level

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Analyte	Metals								
	Arsenic	Boron	Cadmium	Chromium (III+VI)	Copper	Lead	Manganese	Nickel	Zinc
Unit	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Drinking Water	10	4000	2	50	2000	10	500	20	µg/L
Ecological (Freshwater)	13	370	0.2	1	1.4	3.4	1900	11	8
Recreational	100	40,000	20	500	20,000	100	5000	200	µg/L



**Legend**

- Approximate Site Boundary
- Hydrological Features
- Drainage Line
- River/Creek
- Excluded - Energy Australia Owned
- Excluded - Operational Area
- Excluded - Transgrid Switchyard
- Proposed Transfer to Lithgow Council
- Abandoned Monitoring Well
- Existing Monitoring Well
- Monitoring Well
- Sediment Sample
- Surface Soil Sample
- Surface Water Sample
- AECs:
  - MA - Chilter Dam Landfill
  - MA - Construction Landfill
  - MA - Domestic Landfill
  - MB - Coal Storage Area
  - MD - Workshops
  - ME - Mobile Plant Refueling Area
  - MF - Operational ASTs
  - MG - Current Ash Repository
  - MH - Lamberts North (Stage 1)
  - ML - Non Operational Areas
- MH - Lamberts North Ash Repository
- MI - Water Holding Ponds
- MK - Accessible Operational Areas
- ML - Non Operational Areas
- Exceedance of Screening Level
- MK\_MW02 Reported Chromium (III+VI) Concentration in Groundwater (0.2)
- MH\_MW01 Reported Chromium (III+VI) Concentration in Groundwater Exceeding at Least One Screening Level (2)

Source: bing maps imagery date December 2012

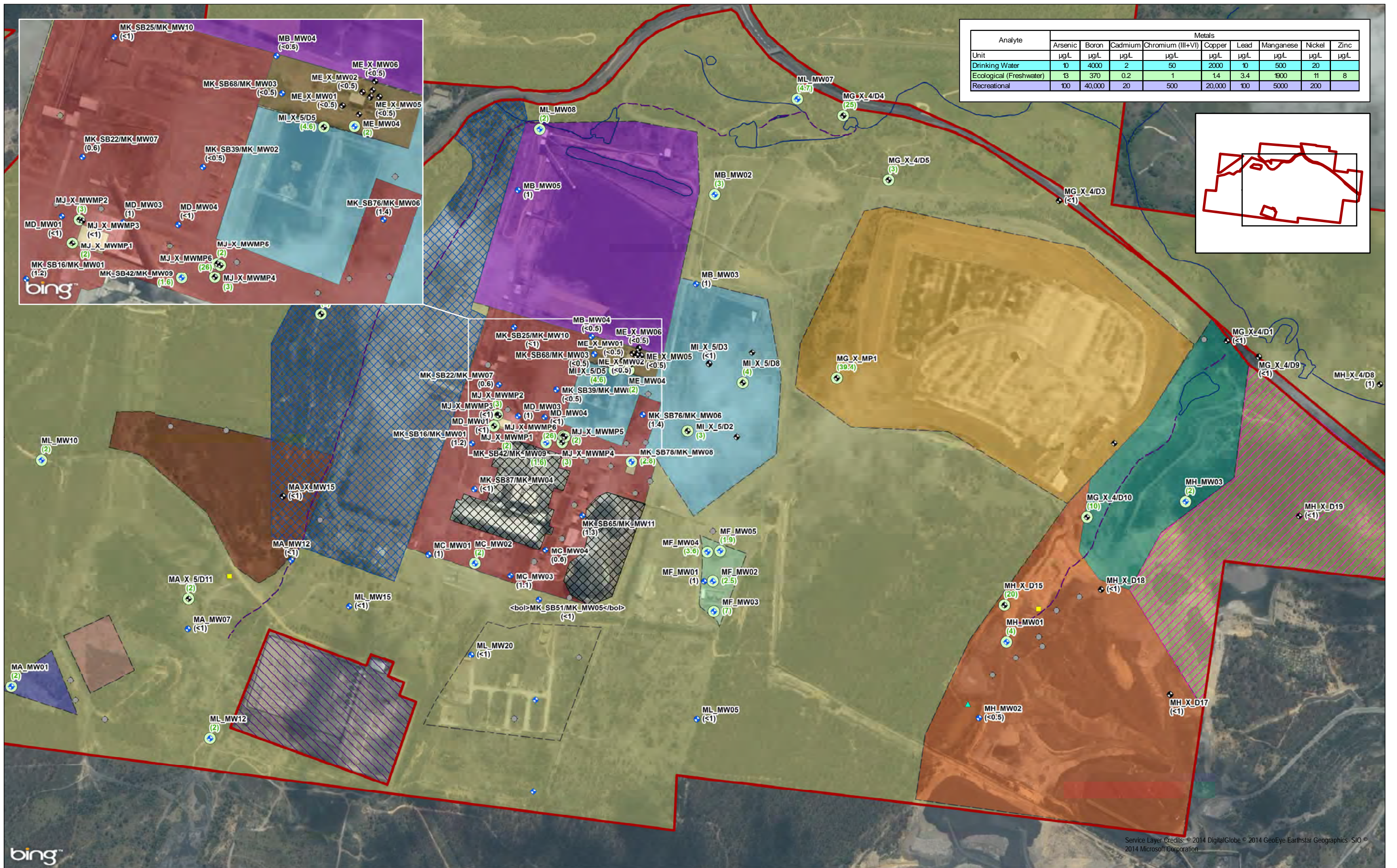
0 50 100 150m

Client: Delta Electricity  
 Drawing No: 0207423s\_MP\_ST2ESA\_G019\_R1.mxd  
 Date: 13/08/2014 Drawing Size: A3  
 Drawn By: GC Reviewed By: AA

**Figure 8.4 - Groundwater Exceedances - Metals (Chromium (III+VI))**

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**Legend**

- Approximate Site Boundary
- Hydrological Features
- Drainage Line
- River/Creek
- Excluded - Energy Australia Owned
- Excluded - Operational Area
- Excluded - Transgrid Switchyard
- Proposed Transfer to Lithgow Council

- ◆ Abandoned Monitoring Well
- ◆ Existing Monitoring Well
- ◆ Monitoring Well
- ◆ Sediment Sample
- ◆ Surface Soil Sample
- ▲ Surface Water Sample

**AECs:**

- MA - Chilter Dam Landfill
- MA - Construction Landfill
- MA - Domestic Landfill
- MB - Coal Storage Area
- MD - Workshops
- ME - Mobile Plant Refueling Area
- MF - Operational ASTs
- MG - Current Ash Repository
- MH - Lamberts North (Stage 1)
- MI - Water Holding Ponds
- MK - Accessible Operational Areas
- ML - Non Operational Areas

- MH - Lamberts North Ash Repository
- MI - Water Holding Ponds
- MK - Accessible Operational Areas
- ML - Non Operational Areas
- Exceedance of Screening Level
- MK\_MW01 (1.2) Reported Copper Concentration in Groundwater
- MH\_MW01 (4) Reported Copper Concentration in Groundwater Exceeding at Least One Screening Level

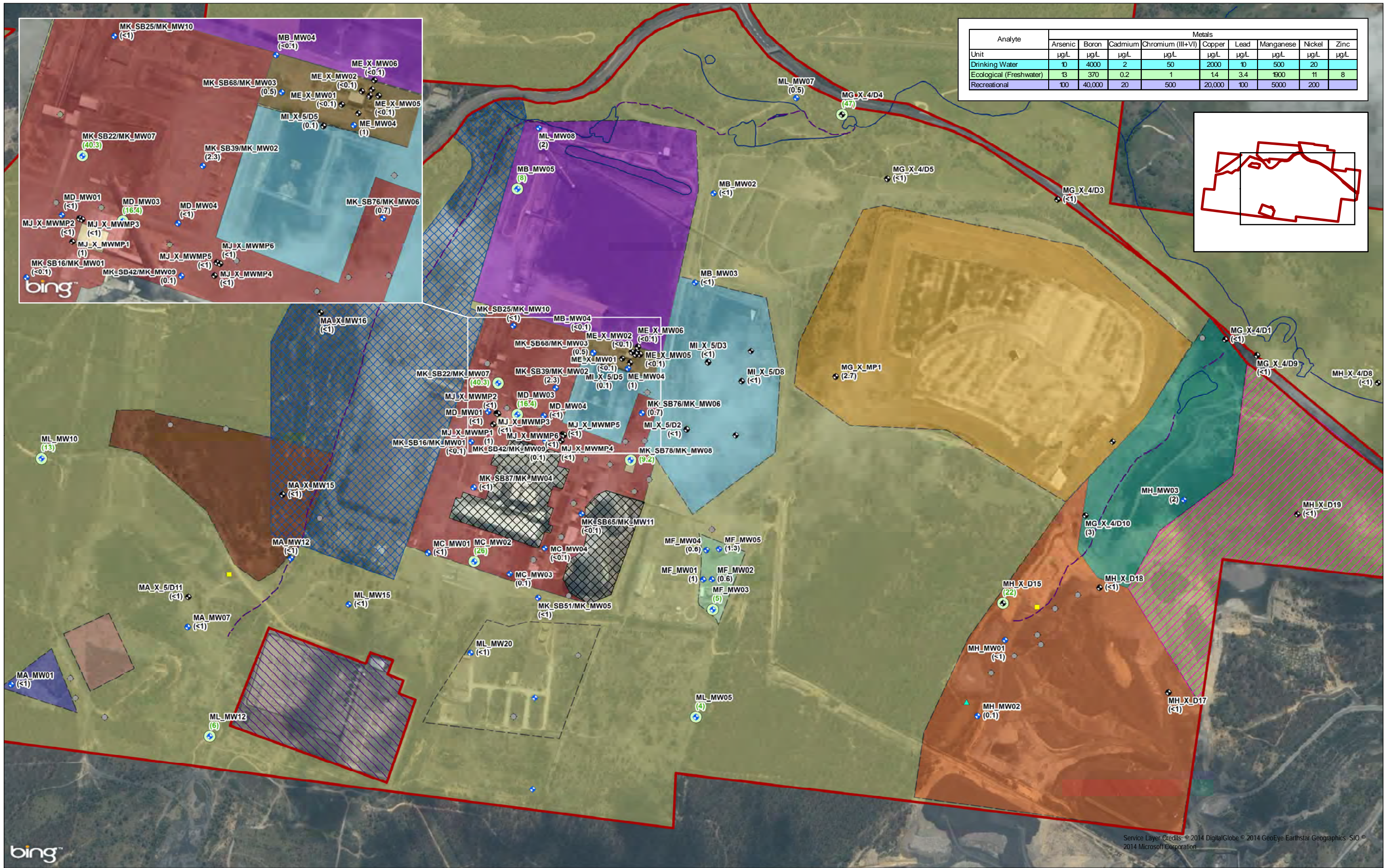
Source: bing maps imagery date December 2012

0 50 100 150m

N

Client: Delta Electricity	<b>Figure 8.5 - Groundwater Exceedances - Metals (Copper)</b>	<p>Project Symphony - Mt Piper Stage 2 Environmental Site Assessment</p> <p>Environmental Resources Management ANZ</p> <p>Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney</p>
Drawing No: 0207423s_MP_ST2ESA_G020_R1.mxd	Reviewed By: AA	
Date: 13/08/2014	Drawn By: GC	
<p>This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.</p>		





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Client: Delta Electricity  
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 Date: 13/08/2014 Drawing Size: A3  
 Drawn By: GC Reviewed By: AA

**Figure 8.6 - Groundwater Exceedances - Metals (Lead)**  
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 Environmental Resources Management ANZ  
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 Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney

Source: bing maps imagery date December 2012

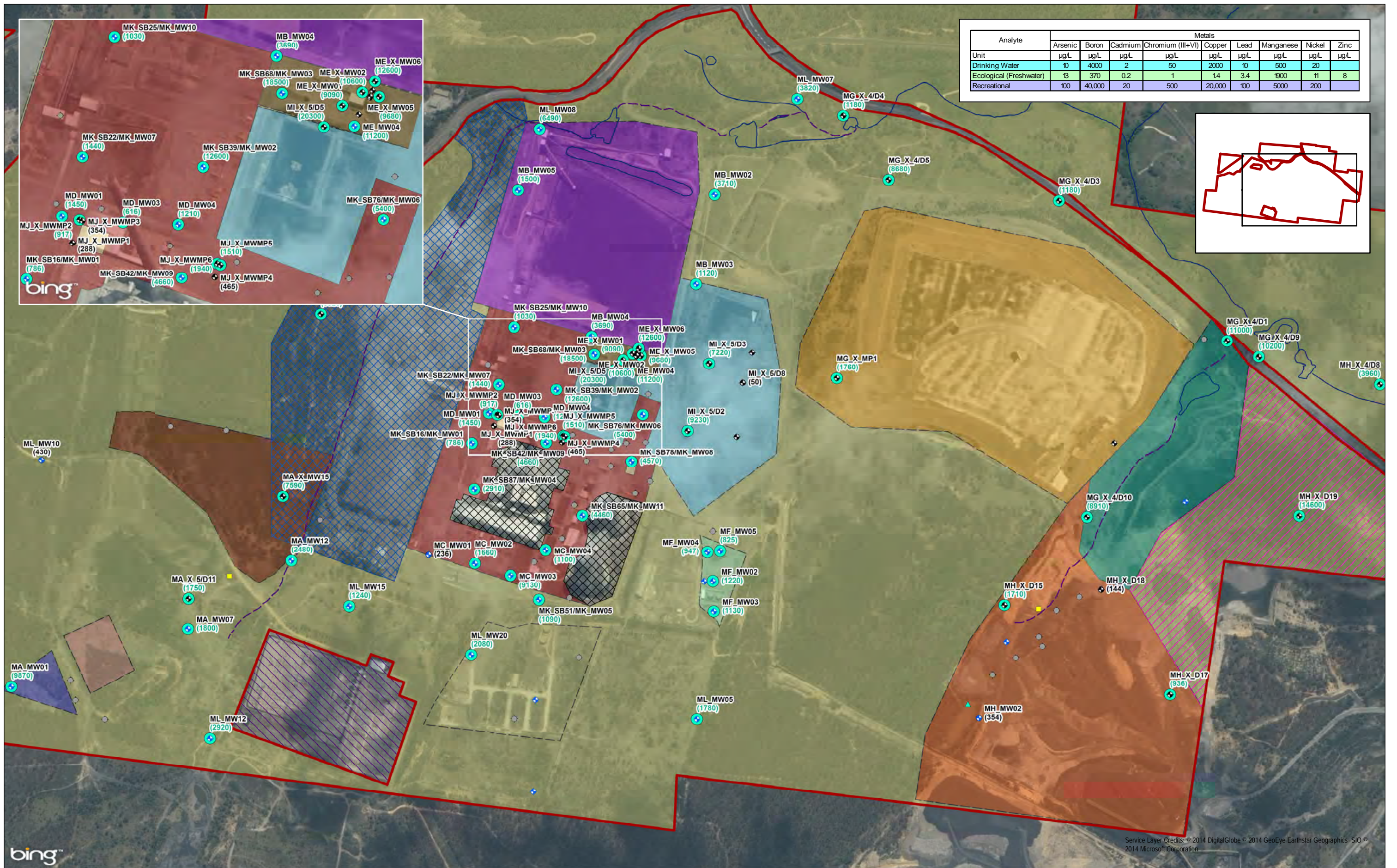
0 50 100 150m

Legend

- Approximate Site Boundary
- Hydrological Features
- Drainage Line
- River/Creek
- Excluded - Energy Australia Owned
- Excluded - Operational Area
- Excluded - Transgrid Switchyard
- Proposed Transfer to Lithgow Council
- Abandoned Monitoring Well
- Existing Monitoring Well
- Monitoring Well
- Sediment Sample
- Surface Soil Sample
- Surface Water Sample
- AECs:
  - MA - Chilter Dam Landfill
  - MA - Construction Landfill
  - MA - Domestic Landfill
  - MB - Coal Storage Area
  - MD - Workshops
  - ME - Mobile Plant Refueling Area
  - MF - Operational ASTs
  - MG - Current Ash Repository
  - MH - Lamberts North (Stage 1)
  - ML - Non Operational Areas
- MH - Lamberts North Ash Repository
- MI - Water Holding Ponds
- MK - Accessible Operational Areas
- ML - Non Operational Areas
- Exceedance of Screening Level
- Reported Lead Concentration in Groundwater Exceeding at Least One Screening Level

ERM





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**Legend**

- Approximate Site Boundary
- Hydrological Features
- Drainage Line
- River/Creek
- Excluded - Energy Australia Owned
- Excluded - Operational Area
- Excluded - Transgrid Switchyard
- Proposed Transfer to Lithgow Council
- Abandoned Monitoring Well
- Existing Monitoring Well
- Monitoring Well
- Sediment Sample
- Surface Soil Sample
- Surface Water Sample

**AECs:**

- MA - Chilter Dam Landfill
- MA - Construction Landfill
- MA - Domestic Landfill
- MB - Coal Storage Area
- MD - Workshops
- ME - Mobile Plant Refueling Area
- MF - Operational ASTs
- MG - Current Ash Repository
- MH - Lamberts North (Stage 1)
- ML - Non Operational Areas

- MH - Lamberts North Ash Repository
- MI - Water Holding Ponds
- MK - Accessible Operational Areas
- ML - Non Operational Areas
- ML\_MW10 (430) Reported Manganese Concentration in Groundwater Exceeding at Least One Screening Level
- MK\_MW10 (1030) Reported Manganese Concentration in Groundwater Exceeding at Least One Screening Level
- Exceedance of Screening Level

Source: bing maps imagery date December 2012

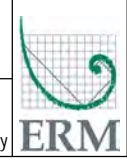
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N

Client: Delta Electricity  
 Drawing No: 0207423s\_MP\_ST2ESA\_G022\_R1.mxd  
 Date: 13/08/2014 Drawing Size: A3  
 Drawn By: GC Reviewed By: AA

**Figure 8.7 - Groundwater Exceedances - Metals (Manganese)**

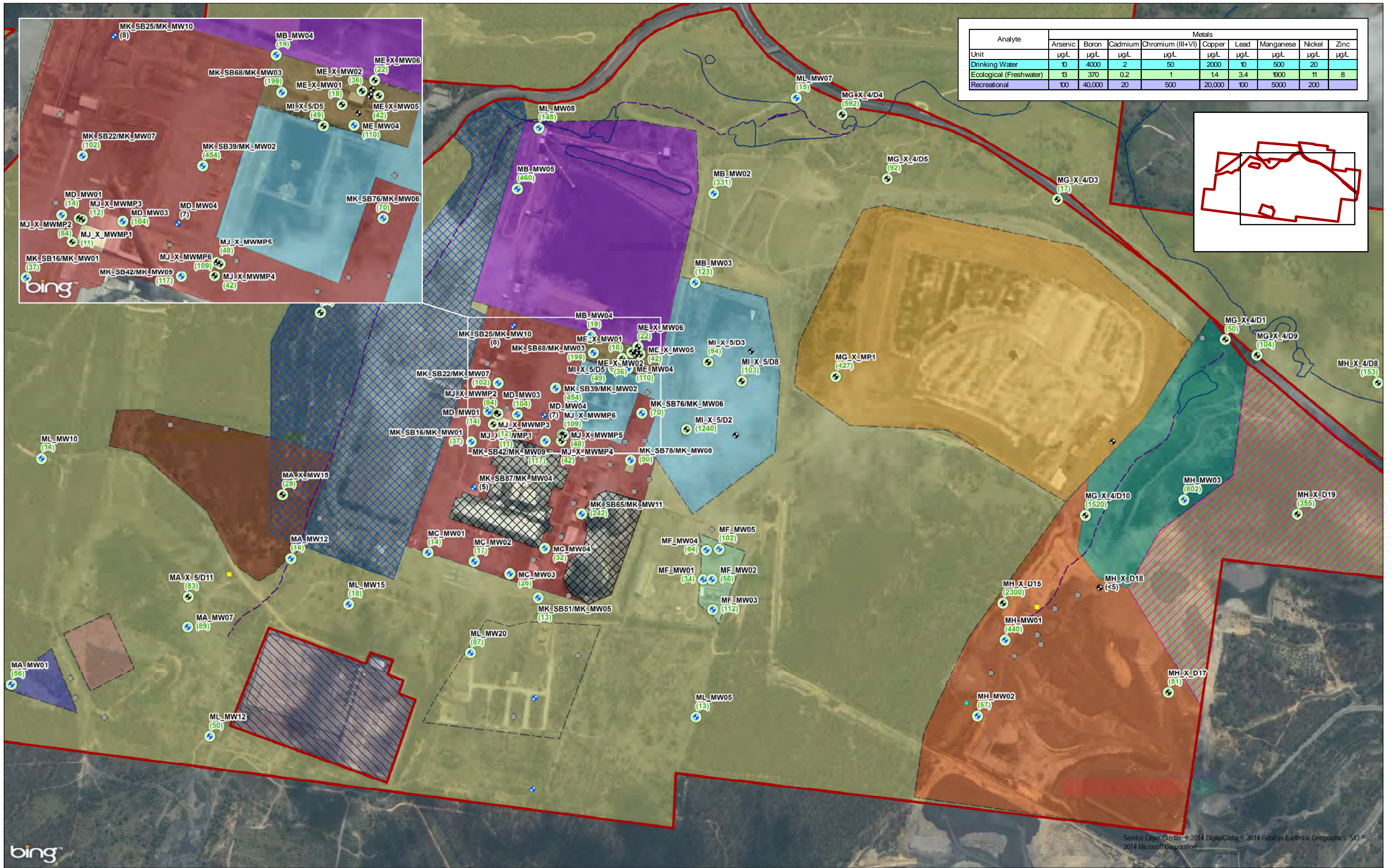
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 Environmental Resources Management ANZ  
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 Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney











**Legend**

- Approximate Site Boundary
- Hydrological Features
- Drainage Line
- River/Creek
- Excluded - Energy Australia Owned
- Excluded - Operational
- Excluded - Transgrid Switchyard
- Proposed Transfer to Lithgow Council
- Abandoned Monitoring Well
- Existing Monitoring Well
- Monitoring Well
- Sediment Sample
- Surface Soil Sample
- Surface Water Sample
- AECs:
  - MA - Chilter Dam Landfill
  - MA - Domestic Landfill
  - MB - Coal Storage
  - MD - Workshops
  - ME - Mobile Plant Refueling Area
  - MF - Operational
  - MG - Current Ash Repository
  - MH - Lamberts North (Stage 1)
  - ML - Non Operational Areas
- MH - Lamberts North Ash Repository
- MI - Water Holding Ponds
- MK - Accessible Operational Areas
- ML - Non Operational Areas
- Exceedance of Screening Level
- MK\_MW04 Reported Zinc Concentration in Groundwater
- MK\_MW01 Reported Zinc Concentration in Groundwater Exceeding at Least One Screening Level

Client: Delta Electricity  
 Drawing No: 0207423s\_MP\_ST2ESA\_G024\_R1.mxd  
 Date: 13/08/2014  
 Drawn By: GC  
 Reviewed By: AA

**Figure 8.9 - Groundwater Exceedances - Metals (Zinc)**

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 Environmental Resources Management ANZ  
 Auckland, Brisbane, Canberra, Christchurch,  
 Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney

Source: bing maps imagery data December 2012

0 50 100 150m

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Annex B

Tables

Location ID	AEC	Location Type	X Coordinate (GDA 94)	Y Coordinate (GDA 94)	Elevation (mAHD)	Survey method
MA_MW01	MA	Monitoring Well	222455	6304458	973.264	Surveyor (CEH)
MA_MW03	MA	Soil Bore	222589	6304559		GPS
MA_MW05	MA	Soil Bore	222647	6304666		GPS
MA_MW07	MA	Monitoring Well	222912.408	6304608.314	956.108	Surveyor (CEH)
MA_MW08	MA	Soil Bore	222768	6304454		GPS
MA_MW12	MA	Monitoring Well	223180.343	6304785.839	946.818	Surveyor (CEH)
MA_X_5/D11	MA	Existing Well	223167.75	6304955.144	946.834	Surveyor (CEH)
MA_X_MW15	MA	Existing Well	223158.42	6304951.376	946.872	Surveyor (CEH)
MA_X_MW16	MA	Existing Well	223256.937	6305424.962	946.126	Surveyor (CEH)
MB_MW01	MB	Soil Bore	224090	6305823		GPS
MB_MW02	MB	Monitoring Well	224277	6305735	930.64	Surveyor (CEH)
MB_MW03	MB	Monitoring Well	224229	6305502	932.998	Surveyor (CEH)
MB_MW04	MB	Monitoring Well	223958	6305367	936.021	Surveyor (CEH)
MB_MW05	MB	Monitoring Well	223711.514	6305632.182	935.314	Surveyor (CEH)
MC_MW01	MC	Monitoring Well	223536	6304801	940.101	Surveyor (CEH)
MC_MW02	MC	Monitoring Well	223656	6304778	939.976	Surveyor (CEH)
MC_MW03	MC	Monitoring Well	223748	6304746	939.995	Surveyor (CEH)
MC_MW04	MC	Monitoring Well	223839	6304813	940.315	Surveyor (CEH)
MD_MW01	MD	Monitoring Well	223692	6305168	940.342	Surveyor (CEH)
MD_MW02	MD	Soil Bore	223723	6305173		Estimation
MD_MW03	MD	Monitoring Well	223768	6305160	940.056	Surveyor (CEH)
MD_MW04	MD	Monitoring Well	223836	6305157	940.177	Surveyor (CEH)
ME_MW04	ME	Monitoring Well	224054.715	6305279.551	936.644	Surveyor (CEH)
ME_SB01	ME	Soil Bore	224044	6305318		GPS
ME_SB02	ME	Soil Bore	224075	6305324		GPS
ME_SB03	ME	Soil Bore	224101	6305266		GPS
ME_X_MW01	ME	Existing Well	224039.736	6305305.227	936.59	Surveyor (CEH)
ME_X_MW02	ME	Existing Well	224064.563	6305322.04	936.282	Surveyor (CEH)
ME_X_MW03	ME	Existing Well	224077.257	6305324.446	936.255	Surveyor (CEH)
ME_X_MW05	ME	Existing Well	224085.543	6305316.425	936.301	Surveyor (CEH)
ME_X_MW06	ME	Existing Well	224080	6305336	936.199	Surveyor (CEH)
ME_X_MWMP7	ME	Existing Well	224060.141	6305294.343	936.505	Surveyor (CEH)
ME_X_MWMP8	ME	Existing Well	224074.074	6305315.535	936.146	Surveyor (CEH)
ME_X_R	ME	Existing Well	224074.448	6305316.776	936.215	Surveyor (CEH)
MF_MW01	MF	Monitoring Well	224250	6304731	951.466	Surveyor (CEH)
MF_MW02	MF	Monitoring Well	224272.296	6304731.44	951.850	Surveyor (CEH)
MF_MW03	MF	Monitoring Well	224275	6304654	954.439	Surveyor (CEH)
MF_MW04	MF	Monitoring Well	224258	6304808	949.193	Surveyor (CEH)
MF_MW05	MF	Monitoring Well	224291	6304811	949.780	Surveyor (CEH)
MG_SB02	MG	Soil Bore	225268	6305066		GPS
MG_SB03	MG	Soil Bore	225028	6304699		GPS
MG_X_4/D1	MG	Existing Well	225604	6305355	912.281	Surveyor (CEH)
MG_X_4/D10	MG	Existing Well	225242	6304898	925.976	Surveyor (CEH)
MG_X_4/D11	MG	Existing Well	225312	6305090		Surveyor (existing)
MG_X_4/D3	MG	Existing Well	225169	6305718	919.887	Surveyor (CEH)
MG_X_4/D4	MG	Existing Well	224610	6305939	919.451	Surveyor (CEH)
MG_X_4/D5	MG	Existing Well	224728	6305772	925.383	Surveyor (CEH)
MG_X_4/D9	MG	Existing Well	225687	6305314	909.632	Surveyor (CEH)
MG_X_MP1	MG	Existing Well	224594	6305258	942.378	Surveyor (CEH)
MH_GRAB	MH	Sediment	225116	6304660		Estimation
MH_MW01	MH	Monitoring Well	225033.028	6304574.317	938.987	Surveyor (CEH)
MH_MW02	MH	Monitoring Well	224961.537	6304377.109	935.579	Surveyor (CEH)
MH_MW03	MH	Monitoring Well	225497.112	6304938.047	928.411	Surveyor (CEH)
MH_SB04	MH	Soil Bore	225026	6304617		GPS
MH_X_4/D8	MH	Existing Well	226000.54	6305241.889	905.899	Surveyor (CEH)
MH_X_D15	MH	Existing Well	225027.487	6304669.496	940.176	Surveyor (CEH)
MH_X_D17	MH	Existing Well	225456.89	6304437.8	935.800	
MH_X_D18	MH	Existing Well	225278.133	6304709.943	932.177	Surveyor (CEH)
MH_X_D19	MH	Existing Well	225791.35	6304901.02	916.950	
MI_SB02	MI	Soil Bore	224311	6305284		GPS
MI_SB03	MI	Soil Bore	224265	6305247		GPS
MI_SB04	MI	Soil Bore	224384	6305325		GPS
MI_SB05	MI	Soil Bore	224325	6305212		GPS
MI_SB06	MI	Soil Bore	224207	6305189		GPS
MI_SB07	MI	Soil Bore	224312	6305093		GPS
MI_SB08	MI	Soil Bore	224371	6305053		GPS
MI_X_5/D2	MI	Existing Well	224207	6305122	943.233	Surveyor (CEH)
MI_X_5/D3	MI	Existing Well	224262	6305296	942.340	Surveyor (CEH)
MI_X_5/D5	MI	Existing Well	224012	6305269		Estimation
MI_X_5/D6	MI	Existing Well	224334	6305106	947.044	Surveyor (CEH)
MI_X_5/D7	MI	Existing Well	224374	6305325	941.356	Surveyor (CEH)
MI_X_5/D8	MI	Existing Well	224350	6305246	946.952	Surveyor (CEH)
MJ_X_MWMP1	MJ	Existing Well	223705.02	6305134.543	940.054	Surveyor (CEH)
MJ_X_MWMP2	MJ	Existing Well	223713.857	6305163.283	940.038	Surveyor (CEH)
MJ_X_MWMP3	MJ	Existing Well	223717.458	6305162.057	939.997	Surveyor (CEH)
MJ_X_MWMP4	MJ	Existing Well	223882	6305092	940.005	Surveyor (CEH)
MJ_X_MWMP5	MJ	Existing Well	223885	6305109	940.178	Surveyor (CEH)
MJ_X_MWMP6	MJ	Existing Well	223889	6305107	940.224	Surveyor (CEH)
MK_SB01	MK	Soil Bore	223571	6305124		GPS
MK_SB02	MK	Soil Bore	223521	6304844		GPS
MK_SB03	MK	Soil Bore	223576	6305058		GPS
MK_SB04	MK	Soil Bore	223571	6304963		GPS
MK_SB05	MK	Soil Bore	223547	6304931		GPS
MK_SB06	MK	Soil Bore	223559	6304895		GPS
MK_SB07	MK	Soil Bore	223557	6304832		GPS
MK_SB08	MK	Soil Bore	223573	6305118		GPS
MK_SB09	MK	Soil Bore	223601	6305076		GPS

Location ID	AEC	Location Type	X Coordinate (GDA 94)	Y Coordinate (GDA 94)	Elevation (mAHD)	Survey method
MK_SB10	MK	Soil Bore	223595	6305043		GPS
MK_SB11	MK	Soil Bore	223621	6304959		GPS
MK_SB12	MK	Soil Bore	223168	6305269		GPS
MK_SB13	MK	Soil Bore	223652	6305237		GPS
MK_SB14	MK	Soil Bore	223654	6305180		GPS
MK_SB15	MK	Soil Bore	223657	6304948		GPS
MK_SB16/MK_MW01	MK	Monitoring Well	223648	6305090	940.399	Surveyor (CEH)
MK_SB17	MK	Soil Bore	223639	6305025		GPS
MK_SB18	MK	Soil Bore	223712	6305427		GPS
MK_SB19	MK	Soil Bore	223704	6305393		GPS
MK_SB20	MK	Soil Bore	223681	6305342		GPS
MK_SB22/MK_MW07	MK	Monitoring Well	223718	6305241	939.452	Surveyor (CEH)
MK_SB24	MK	Soil Bore	223713	6305123		GPS
MK_SB25/MK_MW10	MK	Monitoring Well	223757	6305391	937.363	Surveyor (CEH)
MK_SB26	MK	Soil Bore	223749	6305328		GPS
MK_SB27	MK	Soil Bore	223752	6305290		GPS
MK_SB28	MK	Soil Bore	223760	6305225		GPS
MK_SB30	MK	Soil Bore	223752	6305113		GPS
MK_SB31	MK	Soil Bore	223796	6305387		GPS
MK_SB32	MK	Soil Bore	223799	6305341		GPS
MK_SB33	MK	Soil Bore	223824	6305291		GPS
MK_SB34	MK	Soil Bore	223806	6305250		GPS
MK_SB35	MK	Soil Bore	223794	6305189		GPS
MK_SB36	MK	Soil Bore	223845	6305377		GPS
MK_SB37	MK	Soil Bore	223840	6305332		GPS
MK_SB38	MK	Soil Bore	223862	6305290		GPS
MK_SB39/MK_MW02	MK	Monitoring Well	223867.036	6305228.778	939.085	Surveyor (CEH)
MK_SB40	MK	Soil Bore	223521	6304844		GPS
MK_SB42/MK_MW09	MK	Monitoring Well	223840.501	6305091.518	939.930	Surveyor (CEH)
MK_SB43	MK	Soil Bore	223897	6304951		GPS
MK_SB44	MK	Soil Bore	223885	6304900		GPS
MK_SB45	MK	Surface Sample	223838	6304878		GPS
MK_SB46	MK	Soil Bore	223876	6304806		GPS
MK_SB47	MK	Soil Bore	223860	6304725		GPS
MK_SB49	MK	Soil Bore	223795	6304725		GPS
MK_SB50	MK	Soil Bore	223698	6304697		GPS
MK_SB51/MK_MW05	MK	Monitoring Well	223822	6304684	940.501	Surveyor (CEH)
MK_SB52	MK	Soil Bore	223761	6304697		GPS
MK_SB54	MK	Soil Bore	223896	6305390		GPS
MK_SB55	MK	Soil Bore	223905	6305352		GPS
MK_SB56	MK	Soil Bore	223920	6305305		GPS
MK_SB57	MK	Soil Bore	223913	6305245		GPS
MK_SB58	MK	Soil Bore	223897	6305204		GPS
MK_SB59	MK	Soil Bore	223880	6305154		GPS
MK_SB61	MK	Soil Bore	223890	6305109		GPS
MK_SB62	MK	Soil Bore	223907	6305052		GPS
MK_SB63	MK	Surface Sample	223915	6305020		GPS
MK_SB64	MK	Surface Sample	223902	6304955		GPS
MK_SB65/MK_MW11	MK	Monitoring Well	223934	6304902	942.836	Surveyor (CEH)
MK_SB66	MK	Surface Sample	223966	6304803		GPS
MK_SB67	MK	Surface Sample	223923	6304793		GPS
MK_SB68/MK_MW03	MK	Monitoring Well	223965	6305321	937.955	Surveyor (CEH)
MK_SB69	MK	Surface Sample	223977	6305082		GPS
MK_SB71	MK	Soil Bore	223957	6305003		GPS
MK_SB72	MK	Soil Bore	223967	6304948		GPS
MK_SB75	MK	Surface Sample	224019	6304990		GPS
MK_SB76/MK_MW06	MK	Monitoring Well	224090.732	6305163.534	938.077	Surveyor (CEH)
MK_SB78/MK_MW08	MK	Monitoring Well	224061.577	6305041.807	940.202	Surveyor (CEH)
MK_SB79	MK	Soil Bore	224089	6305002		GPS
MK_SB81	MK	Soil Bore	224131	6305175		GPS
MK_SB82	MK	Soil Bore	224117	6305148		GPS
MK_SB84	MK	Soil Bore	224140	6305002		GPS
MK_SB86	MK	Soil Bore	224695	6305193		GPS
MK_SB87/MK_MW04	MK	Monitoring Well	223654.333	6304969.759	940.266	Surveyor (CEH)
ML_MW02	ML	Soil Bore	224126	6304805		GPS
ML_MW03	ML	Monitoring well	223807.068	6304186.698	965.919	Surveyor (CEH)
ML_MW05	ML	Monitoring well	224230.841	6304374.026	972.023	Surveyor (CEH)
ML_MW07	ML	Monitoring well	224490.957	6305982.259	920.218	Surveyor (CEH)
ML_MW08	ML	Monitoring well	223773	6305842	935.109	Surveyor (CEH)
ML_MW10	ML	Monitoring well	222533	6305046	974.752	Surveyor (CEH)
ML_MW12	ML	Monitoring well	222970	6304324	954.714	Surveyor (CEH)
ML_MW14	ML	Surface sample	222774	6305894		GPS
ML_MW15	ML	Monitoring well	223329.968	6304666.551	950.161	Surveyor (CEH)
ML_MW17	ML	Soil Bore	223893	6304375		GPS
ML_MW18	ML	Soil Bore	223726	6304358		GPS
ML_MW19	ML	Soil Bore	223760	6304519		GPS
ML_MW20	ML	Monitoring Well	223646	6304541	959.742	Surveyor (CEH)
ML_MW21	ML	Monitoring Well	223812.943	6304423.705	962.315	Surveyor (CEH)
ML_MW23	ML	Soil Bore	223878	6304518		GPS
ML_MW24	ML	Soil Bore	223603	6304383		GPS
ML_SB22	ML	Surface sample	223851	6304618		GPS
ML_SB25	ML	Surface sample	223671	6304365		GPS
ML_SB26	ML	Surface sample	223704	6304411		GPS
ML_SB27	ML	Surface sample	223672	6304439		GPS
ML_SB28	ML	Surface sample	223744	6304462		GPS
ML_SB29	ML	Surface sample	223763	6304427		GPS
ML_SB30	ML	Surface sample	223906	6304445		GPS



Location ID	AEC	Location Type	X Coordinate (GDA 94)	Y Coordinate (GDA 94)	Elevation (mAHD)	Survey method
ML_SB31	ML	Surface sample	223822	6304550		GPS
ML_SB32	ML	Surface sample	223845	6304383		GPS
ML_SB34	ML	Surface sample	223875	6304565		GPS
ML_SB35	ML	Surface Sample	223711	6304600		GPS
ML_SB36	ML	Surface Sample	223626	6304499		GPS
ML_SB37	ML	Surface Sample	223624	6304443		GPS
ML_SB38	ML	Surface Sample	226734	6304524		GPS
ML_SB39	ML	Surface Sample	223820	6304475		GPS
ML_SB40	ML	Surface Sample	223805	6304348		GPS

Well ID	Gauging Date	Event	TOC Elevation (mAHD)	Ground Surface Elevation (mAHD)	Total Measured Depth (mbTOC)	Depth to LNAPL (mbTOC)	Depth to Water (mbTOC)	LNAPL Thickness (m)	Well Screened Interval (m)	Corrected Depth to Water (mbTOC)	Corrected Water Elevation (mAHD)	Comments
MA_MW01	16-Dec-13	Pre	973.946	973.264	5.500	-	3.736	-	2.8 - 4.3	3.736	970.210	Slightly cloudy, pale brown, no odour
MA_MW07	16-Dec-13	Pre	956.608	956.108	9.055	-	7.692	-	5.2 - 8.2	7.692	948.916	Cloudy, pale brown
MA_MW12	16-Dec-13	Pre	947.505	946.818	5.741	-	4.457	-	3.0 - 5.0	4.457	943.048	Slightly cloudy, no odour
MA_X_5/D11	06-Nov-13	Pre	947.196	946.834	12.424	-	7.365	-	Unknown	7.365	939.831	Clear, yellow, no odour
MA_X_MW15	05-Nov-13	Pre	947.524	946.872	5.938	-	3.035	-	Unknown	3.035	944.489	Clear, brown, no odour
MA_X_MW16	05-Nov-13	Pre	946.861	946.126	5.481	-	2.682	-	Unknown	2.682	944.179	Clear, colourless, no odour
MB_MW02	18-Dec-13	Pre	931.33	930.64	13.466	-	12.720	-	10.5 - 13.5	12.720	918.610	Very turbid, no sheen, no odour
MB_MW03	18-Dec-13	Pre	932.942	932.998	7.695	-	4.020	-	5.2 - 7.7	4.020	928.922	Cloudy, no sheen, no odour
MB_MW04	19-Dec-13	Pre	936.068	936.021	8.224	-	2.415	-	5.7 - 8.2	2.415	933.653	Cloudy, pale brown, no odour
MB_MW05	18-Dec-13	Pre	936.029	935.314	7.932	-	6.676	-	5.4 - 7.9	6.676	929.353	Clear, no sheen, no odour
MC_MW01	16-Dec-13	Pre	940.057	940.101	5.376	-	1.220	-	2.4 - 5.4	1.220	938.837	Clear, colourless, no odour (slow pump rate)
MC_MW02	16-Dec-13	Pre	939.916	939.976	5.055	-	2.508	-	2.0 - 5.0	2.508	937.408	Clear, colourless, no odour
MC_MW03	17-Dec-13	Pre	939.931	939.995	5.043	-	2.755	-	2.0 - 5.0	2.755	937.176	Cloudy brown
MC_MW04	17-Dec-13	Pre	940.233	940.315	6.236	-	2.941	-	3.2 - 6.2	2.941	937.292	Clear, colourless, no odour
MD_MW01	17-Dec-13	Pre	940.252	940.342	6.975	-	3.241	-	3.0 - 7.0	3.241	937.011	Clear, colourless, no odour
MD_MW03	17-Dec-13	Pre	939.937	940.056	3.984	-	1.775	-	1.0 - 4.0	1.775	938.162	Clear, colourless, no odour
MD_MW04	17-Dec-13	Pre	940.105	940.177	5.722	-	2.515	-	2.8 - 5.8	2.515	937.590	Slightly cloudy, brown, very light oily looking film, no odour
ME_MW04	18-Dec-13	Pre	936.569	936.644	8.030	-	5.485	-	3.8 - 7.8	5.485	931.084	Clear, no sheen, no odour
ME_X_MW01	19-Dec-13	Pre	936.674	936.59	6.040	-	5.650	-	Unknown	5.650	931.024	Clear water
ME_X_MW02	19-Dec-13	Pre	936.336	936.282	7.510	-	5.200	-	Unknown	5.200	931.136	Clear water, no odour.
ME_X_MW03	18-Dec-13	Pre	936.246	936.255	7.350	5.145	5.195	0.05	Unknown	5.195	931.051	LNAPL detected with interface probe.
ME_X_MW05	19-Dec-13	Pre	936.301	936.301	6.036	-	5.180	-	Unknown	5.180	931.121	Cloudy, brown, no odour
ME_X_MW06	19-Dec-13	Pre	936.192	936.199	5.975	-	5.070	-	Unknown	5.070	931.122	No odour, clear water
ME_X_MWMP7	31-Oct-13	Pre	936.458	936.505	-	5.33	5.332	0.002	Unknown	5.332	931.126	LNAPL verified with bailer. 2mm sheen on bailer, dark cloudy material in bottom of bailer
ME_X_MWMP8	31-Oct-13	Pre	936.098	936.146	-	3.377	3.577	0.2	Unknown	3.577	932.521	LNAPL detected with interface probe. Confirmed with bailer.
MF_MW01	17-Dec-13	Pre	952.094	951.466	16.070	-	15.638	-	14.5 - 16.0	15.638	936.456	Turbid, no sheen, no odour
MF_MW02	17-Dec-13	Pre	952.537	951.85	25.240	-	15.387	-	21.0 - 25.0	15.387	937.150	Cloudy, no sheen, no odour
MF_MW03	18-Dec-13	Pre	955.123	954.439	13.240	-	9.177	-	10.0 - 13.0	9.177	945.946	Turbid, slight sheen, no odour
MF_MW04	16-Dec-13	Pre	949.889	949.193	15.800	-	12.420	-	11.8 - 15.8	12.420	937.469	Slightly silty, no sheen, no odour
MF_MW05	16-Dec-13	Pre	950.365	949.780	27.668	-	26.522	-	21.0 - 27.0	26.522	923.843	Clear, no sheen, no odour
MG_X_4/D1	04-Nov-13	Pre	912.931	912.281	11.009	-	2.153	-	Unknown	2.153	910.778	Clear, suspended particles, no odour
MG_X_4/D3	07-Nov-13	Pre	920.062	919.887	16.275	-	7.002	-	Unknown	7.002	913.060	Slightly cloudy, pale yellow, no odour
MG_X_4/D4	08-Nov-13	Pre	919.701	919.451	7.123	-	1.660	-	Unknown	1.660	918.041	Clear, no odour
MG_X_4/D5	01-Nov-13	Pre	925.778	925.383	21.650	-	11.090	-	Unknown	11.090	914.688	Slightly cloudy, no odour
MG_X_4/D9	07-Nov-13	Pre	909.707	909.632	4.040	-	1.690	-	Unknown	1.690	908.017	Clear, yellow, no odour
MG_X_4/D10	06-Nov-13	Pre	926.096	925.976	23.955	-	13.945	-	Unknown	13.945	912.151	Clear, no odour
MG_X_4/D11	06-Nov-13	Pre	*	*	17.400	-	Dry	-	Unknown	Dry	-	Dry
MG_X_MP1	17-Dec-13	Pre	943.004	942.378	28.820	-	28.386	-	Unknown	28.386	914.618	Limited sample
MH_MW01	17-Dec-13	Pre	939.597	938.987	28.900	-	24.390	-	23.0 - 29.0	24.390	915.207	Silty, no sheen, no odour
MH_MW02	16-Dec-13	Pre	935.510	935.579	14.701	-	11.551	-	11.6 - 14.6	11.551	923.959	Clear, no sheen, no odour
MH_MW03	17-Dec-13	Pre	928.365	928.411	22.670	-	18.708	-	16.0 - 22.0	18.708	909.657	Silty, no sheen, no odour
MH_X_4/D8	18-Dec-13	Pre	906.449	905.899	12.000	-	2.375	-	Unknown	2.375	904.074	Clear, colourless, no odour
MH_X_D15	06-Nov-13	Pre	940.806	940.176	29.300	-	26.625	-	Unknown	26.625	914.181	Very turbid, black, floating sediment, sheen, organic soil odour
MH_X_D17	08-Nov-13	Pre	936.550	935.800	34.255	-	26.711	-	Unknown	26.711	909.839	Very turbid, grey, no odour
MH_X_D18	06-Nov-13	Pre	932.768	932.177	43.500	-	21.000	-	Unknown	21.000	911.768	Turbid, grey, strong gas/oil odour
MH_X_D19	08-Nov-13	Pre	917.620	916.950	13.009	-	7.906	-	Unknown	7.906	909.714	Clear, colourless, no odour
MI_X_5/D2	31-Oct-13	Pre	943.420	943.233	13.825	-	12.105	-	Unknown	12.105	931.315	Slightly cloudy, no odour
MI_X_5/D3	31-Oct-13	Pre	942.760	942.340	16.895	-	11.560	-	Unknown	11.560	931.200	Clear, no odour
MI_X_5/D5	19-Dec-13	Pre	*	*	10.320	-	6.845	-	Unknown	-	-	Clear, no odour
MI_X_5/D6	31-Oct-13	Pre	947.381	947.044	10.435	-	Dry	-	Unknown	Dry	-	Not sampled, dry
MI_X_5/D7	31-Oct-13	Pre	941.961	941.356	20.050	-	Dry	-	Unknown	Dry	-	Not sampled, dry
MI_X_5/D8	31-Oct-13	Pre	947.317	946.952	13.803	-	10.197	-	Unknown	10.197	937.120	Clear, colourless, no odour
MJ_X_MWMP1	03-Oct-13	Pre	940.024	940.054	3.970	-	0.633	-	Unknown	0.633	939.391	Brown, cloudy, no odour.
MJ_X_MWMP2	03-Oct-13	Pre	940.025	940.038	6.800	-	2.830	-	Unknown	2.830	937.195	Grey, slightly cloudy, no odour.
MJ_X_MWMP3	03-Oct-13	Pre	939.984	939.997	3.640	-	1.121	-	Unknown	1.121	938.863	Cloudy, grey, no odour, no sheen.
MJ_X_MWMP4	31-Oct-13	Pre	939.941	940.005	4.041	-	1.958	-	Unknown	1.958	937.983	Slightly cloudy, brown, no odour
MJ_X_MWMP5	31-Oct-13	Pre	940.195	940.178	4.038	-	2.173	-	Unknown	2.173	938.022	Cloudy, light orange, no odour
MJ_X_MWMP6	31-Oct-13	Pre	940.193	940.224	4.020	-	2.150	-	Unknown	2.150	938.043	Clear, colourless, no odour
MK_MW01	18-Dec-13	Pre	940.335	940.399	6.968	-	3.205	-	3.0 - 7.0	3.205	937.130	Clear, colourless, no odour
MK_MW02	18-Dec-13	Pre	939.049	939.085	6.074	-	2.345	-	3.0 - 6.0	2.345	936.704	Slightly cloudy, no odour
MK_MW03	18-Dec-13	Pre	937.886	937.955	6.855	-	3.185	-	2.8 - 6.8	3.185	934.701	Slightly cloudy, clear and colourless

Well ID	Gauging Date	Event	TOC Elevation (mAHD)	Ground Surface Elevation (mAHD)	Total Measured Depth (mbTOC)	Depth to LNAPL (mbTOC)	Depth to Water (mbTOC)	LNAPL Thickness (m)	Well Screened Interval (m)	Corrected Depth to Water (mbTOC)	Corrected Water Elevation (mAHD)	Comments
MK_MW04	19-Dec-13	Pre	940.204	940.266	6.980	-	3.133	-	3.0 - 7.0	3.133	937.071	Very light white, oily looking film on surface
MK_MW05	19-Dec-13	Pre	941.111	940.501	5.784	-	4.232	-	3.0 - 5.0	4.232	936.879	Cloudy, grey, no odour
MK_MW06	19-Dec-13	Pre	938.058	938.077	5.082	-	4.695	-	1.5 - 5.0	4.695	933.363	Cloudy, brown, no odour
MK_MW07	17-Dec-13	Pre	940.281	939.452	7.802	-	3.359	-	3.0 - 7.0	3.359	936.922	Clear, colourless, no odour
MK_MW08	19-Dec-13	Pre	940.183	940.202	6.304	-	6.236	-	3.3 - 6.3	6.236	933.947	Cloudy brown, turbid, no odour
MK_MW09	18-Dec-13	Pre	940.040	939.930	5.885	-	1.730	-	3.5 - 6.0	1.730	938.310	Clear, colourless, no odour
MK_MW10	19-Dec-13	Pre	938.011	937.363	23.573	-	3.125	-	2.0 - 22.4	3.125	934.886	Turbid, no sheen, no odour
MK_MW11	18-Dec-13	Pre	940.199	942.836	5.115	-	3.277	-	2.0 - 5.0	3.277	936.922	Cloudy, brown/grey, no odour
ML_MW05	19-Dec-13	Pre	972.861	972.023	19.000	-	16.890	-	15.0 - 18.0	16.890	955.971	Cloudy, grey, no odour
ML_MW07	18-Dec-13	Pre	920.904	920.218	5.964	-	4.992	-	3.5 - 5.0	4.992	915.912	Cloudy, pale brown, no odour
ML_MW08	18-Dec-13	Pre	935.799	935.109	7.702	-	5.410	-	4.8 - 7.8	5.410	930.389	Cloudy, no sheen, no odour
ML_MW10	19-Dec-13	Pre	975.418	974.752	17.630	-	14.510	-	12.0 - 17.0	14.510	960.908	Slightly cloudy, grey, no odour
ML_MW12	16-Dec-13	Pre	955.484	954.714	9.050	-	5.680	-	6.0 - 8.0	5.680	949.804	Slightly cloudy, no odour
ML_MW15	19-Dec-13	Pre	950.881	950.161	16.666	-	8.533	-	12.0 - 16.0	8.533	942.348	Cloudy, grey, no odour
ML_MW20	19-Dec-13	Pre	960.532	959.742	24.768	-	22.250	-	22.0 - 24.0	22.250	938.282	Clear, no sheen, no odour
ML_MW21	19-Dec-13	Pre	962.995	962.315	24.455	-	Dry	-	18.0 - 25.0	Dry	-	Not sampled, dry

Notes:

mAHD metres Australian Height Datum  
 mbTOC metres below top of casing  
 m metres  
 Pre pre-purging

\* No survey data available  
 NA Groundwater elevation not available





Table 3. Groundwater Field Parameters  
Mt Piper Power Station - Stage 2 ESA  
Project Symphon - 0207423

				Field				
				pH	Temperature	Electrical Conductivity	Dissolved Oxygen	ORP
				pH_Units	oC	µS/cm	mg/L	mV
Location Code	Field ID	Sample Code	Sampled Date					
MA_MW01	MA_MW01	ES1327570004	16-Dec-13	6.12	22.1	2.6	5.05	-85.0
MA_MW07	MA_MW07	ES1327570001	16-Dec-13	6.41	22.4	0.2	7.03	68.7
MA_MW12	MA_MW12	ES1327570005	16-Dec-13	6.08	16.1	449	0.21	-45.3
MA_X_5/D11	MA_X_5/D11	ES1324232005	06-Nov-13	6.09	16.1	564	0.39	44.4
MA_X_MW15	TE_MW15	ES1324232001	05-Nov-13	6.35	16.2	643	0.32	-82.2
MA_X_MW16	TE_MW16	ES1324232002	05-Nov-13	5.83	16.2	439.7	0.94	54.7
MB_MW02	MB_MW02	ES1328003003	18-Dec-13	5.82	18.8	413.4	0.31	51.9
MB_MW03	MB_MW03	ES1328003005	18-Dec-13	5.03	18.1	404.2	0.56	156.2
MB_MW04	MB_MW04	ES1328001003	19-Dec-13	6.44	21.4	739	0.28	-14.8
MB_MW05	MB_MW05	ES1328003001	18-Dec-13	5.13	18.0	544	0.22	138.1
MC_MW01	MC_MW01	ES1327570006	16-Dec-13	6.39	18.0	452.6	0.13	-28.2
MC_MW02	MC_MW02	ES1327570007	16-Dec-13	6.45	19.3	642	1.98	64.8
MC_MW03	MC_MW03	ES1328041001	17-Dec-13	6.36	18.1	855	0.29	-20.5
MC_MW04	MC_MW04	ES1328041002	17-Dec-13	6.24	20.3	680	0.18	-7.1
MD_MW01	MD_MW01	ES1328041003	17-Dec-13	6.38	17.1	431.1	0.14	-45.6
MD_MW03	MD_MW03	ES1328041004	17-Dec-13	5.06	22.0	970	0.92	156.0
MD_MW04	MD_MW04	ES1328041006	17-Dec-13	6.98	20.4	325.7	0.13	-0.8
ME_X_MW01	ME_MW01	ES1328000002	19-Dec-13	6.56	17.5	933	1.54	4.4
ME_X_MW02	ME_MW02	ES1328000003	19-Dec-13	6.64	16.8	746	2.26	-51.2
ME_MW04	ME_MW04	ES1328003004	18-Dec-13	6.12	19.1	1005	0.39	6.4
ME_X_MW05	ME_MW05	ES1328001006	19-Dec-13	6.55	19.6	736	0.35	26.1
ME_X_MW06	ME_MW06	ES1328000004	19-Dec-13	6.59	16.8	725	0.35	-44.2
MF_MW01	MF_MW01	ES1327849002	17-Dec-13	5.89	21.0	287.8	0.19	90.1
MF_MW02	MF_MW02	ES1327849003	17-Dec-13	6.13	20.1	422.5	0.26	15.0
MF_MW03	MF_MW03	ES1328003006	18-Dec-13	5.30	18.4	315.1	1.22	194.9
MF_MW04	MF_MW04	ES1327569001	16-Dec-13	5.47	17.9	220.6	0.30	122.6
MF_MW05	MF_MW05	ES1327569003	16-Dec-13	6.52	21.7	618	0.75	70.1
MG_X_4/D1	MG_X_4/D1	ES1323856008	04-Nov-13	5.94	14.7	2533	0.24	13.2
MG_X_4/D3	MG_X_4/D3	ES1324232012	07-Nov-13	6.05	17.4	870	0.23	18.3
MG_X_4/D4	MG_X_4/D4	ES1324556003	08-Nov-13	3.31	17.0	1232	0.63	255.1
MG_X_4/D5	MG_X_4/D5	ES1323856007	01-Nov-13	6.04	17.4	1190	0.28	-6.9
MG_X_4/D9	MG_X_4/D9	ES1324232011	07-Nov-13	6.15	14.1	1943	0.06	3.3
MG_X_4/D10	MG_X_4/D10	ES1324232010	06-Nov-13	5.32	19.6	5523	0.60	170.4
MH_MW01	MH_MW01	ES1327849001	17-Dec-13	5.89	17.6	1778	0.17	123.2
MH_MW02	MH_MW02	ES1327569002	16-Dec-13	6.06	17.7	220.6	0.20	-13
MH_MW03	MH_MW03	ES1327849005	17-Dec-13	5.79	18.5	3447	0.28	61.9
MH_X_4/D8	MH_X_4/D8	ES1327988001	18-Dec-13	5.53	17.4	1000	0.47	172.7
MH_X_D15	MH_X_D15	ES1324232006	06-Nov-13	4.24	24.5	2190	0.47	250.2
MH_X_D17	MH_X_D17	ES1324556001	08-Nov-13	6.60	32.9	1659	0.02	-2.4
MH_X_D18	MH_X_D18	ES1324232004	06-Nov-13	6.91	21.4	633	0.07	-126.7
MH_X_D19	MH_X_D19	ES1324556002	08-Nov-13	5.93	18.8	3753	0.96	18.1
ML_X_5/D2	ML_X_5/D2	ES1323856001	31-Oct-13	5.55	18.1	1114	0.63	72.0
ML_X_5/D3	ML_X_5/D3	ES1323856002	31-Oct-13	5.94	17.9	829	0.54	33.9
ML_X_5/D5	MP-GM-5/D5	ES1328000001	19-Dec-13	6.28	17.7	1491	1.93	91.1
ML_X_5/D8	ML_X_5/D8	ES1323856006	31-Oct-13	5.57	18.7	716	0.21	187.9
MJ_X_MWMP1	MWMP_01	ES1321739001	03-Oct-13	6.47	24.4	200.7	4.08	-8.7
MJ_X_MWMP2	MWMP_02	ES1321739002	03-Oct-13	5.79	20.9	280.4	0.15	28.8
MJ_X_MWMP3	MWMP_03	ES1321739003	03-Oct-13	6.44	17.8	117.3	0.97	-80.1
MJ_X_MWMP4	MJ_X_MWMP4	ES1323856003	31-Oct-13	6.15	19.9	192.6	4.16	87.1
MJ_X_MWMP5	MJ_X_MWMP5	ES1323856004	31-Oct-13	6.06	17.1	651	0.24	-4.4
MJ_X_MWMP6	MJ_X_MWMP6	ES1323856005	31-Oct-13	6.05	17.6	663	0.45	28.9
MK_SB16	MK_MW01	ES1328002006	18-Dec-13	6.30	17.5	317.7	0.72	78.2
MK_SB22	MK_MW07	ES1328041007	17-Dec-13	5.61	18.9	298.1	0.65	152.1
MK_SB25	MK_MW10	ES1327997001	19-Dec-13	7.52	19.1	934.1	0.23	22.4
MK_SB39	MK_MW02	ES1328002002	18-Dec-13	6.04	17.8	814	1.14	105.0
MK_SB42	MK_MW09	ES1328002005	18-Dec-13	5.81	18.9	1279	0.87	2.7
MK_SB51	MK_MW05	ES1328001001	19-Dec-13	6.29	20.0	597	0.17	18.3
MK_SB65	MK_MW11	ES1328002004	18-Dec-13	5.62	18.0	667	0.66	66.8
MK_SB68	MK_MW03	ES1328002001	18-Dec-13	5.55	17.8	907	1.00	81.6
MK_SB76	MK_MW06	ES1328001005	19-Dec-13	6.53	19.3	837	0.24	23.6
MK_SB78	MK_MW08	ES1328001004	19-Dec-13	5.98	21.4	853	2.69	30.4
MK_SB87	MK_MW04	ES1328001002	19-Dec-13	6.76	19.0	516	0.31	-34.5
ML_MW05	ML_MW05	ES1327988004	19-Dec-13	6.85	20.9	2496	2.53	-35.9
ML_MW07	ML_MW07	ES1328002003	18-Dec-13	6.25	16.8	437.3	0.54	17.1
ML_MW08	ML_MW08	ES1328003002	18-Dec-13	4.94	16.5	384.3	2.20	187.4
ML_MW10	ML_MW10	ES1327988003	19-Dec-13	6.50	16.8	1136	1.56	78.4
ML_MW12	ML_MW12	ES1327570003	16-Dec-13	6.20	23.3	0.2	5.72	52.3
ML_MW15	ML_MW15	ES1327988002	19-Dec-13	6.64	18.5	595	3.19	-78.7
ML_MW20	ML_MW20	ES1327997002	19-Dec-13	6.07	17.7	381.1	0.40	22.4

Statistical Summary					
Number of Results	69.00	69.0	69	69.00	69.0
Number of Detects	69.00	69.0	69	69.00	69.0
Minimum Concentration	3.31	14.1	0.2	0.02	-126.7
Maximum Concentration	7.52	32.9	5523	7.03	255.1
Average Concentration	6.00	19.0	902	1.00	44.0
Median Concentration	6.09	18.1	663	0.45	26.1
Standard Deviation	0.63	2.7	913	1.40	80.0



Table 4a. AEC - MA Soil Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	TRH										BTEX							Metals																
	TRH >C6-C9 Fraction	TRH >C10-C14 Fraction	TRH >C15-C28 Fraction	TRH >C29-C36 Fraction	TRH >C10-C36 Fraction	TRH >C6-C10 Fraction	TRH >C6-C10 less BTEX (F1)	TRH >C10-C16 Fraction	TRH >C10-C16 less Naphthalene (F2)	TRH >C16-C34 Fraction	TRH >C34-C40 Fraction	TRH >C10-C40 Fraction	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Total BTEX	Arsenic	Boron	Cadmium	Chromium (III+VI)	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Zinc	Acenaphthene	Acenaphthylene		
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		
EQI	10	50	100	100	50	10	10	50	50	100	100	50	0.2	0.5	0.5	0.5	0.5	0.5	0.2	1	5	0.1	1	1	1	10	0.01	1	0.1	1	0.5	0.5		
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND							260 <sup>#9</sup>	NL <sup>#9</sup>					3 <sup>#9</sup>	NL <sup>#9</sup>	NL <sup>#9</sup>			230 <sup>#9</sup>																
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND							370 <sup>#8</sup>	NL <sup>#8</sup>					3 <sup>#8</sup>	NL <sup>#8</sup>	NL <sup>#8</sup>			NL <sup>#8</sup>																
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND							630 <sup>#7</sup>	NL <sup>#7</sup>					3 <sup>#7</sup>	NL <sup>#7</sup>	NL <sup>#7</sup>			NL <sup>#7</sup>																
Human Health - HSL-D - Vapour Intrusion + 4m SAND							NL <sup>#10</sup>	NL <sup>#10</sup>					3 <sup>#10</sup>	NL <sup>#10</sup>	NL <sup>#10</sup>			NL <sup>#10</sup>																
Human Health - Intrusive - Vapour Intrusion 0-<2m							NL <sup>#3</sup>	NL <sup>#3</sup>					77 <sup>#3</sup>	NL <sup>#3</sup>	NL <sup>#3</sup>			NL <sup>#3</sup>																
Human Health - Intrusive - Vapour Intrusion 2-<4m							NL <sup>#2</sup>	NL <sup>#2</sup>					160 <sup>#2</sup>	NL <sup>#2</sup>	NL <sup>#2</sup>			NL <sup>#2</sup>																
Human Health - Intrusive - Vapour Intrusion + 4m							NL <sup>#4</sup>	NL <sup>#4</sup>					NL <sup>#4</sup>	NL <sup>#4</sup>	NL <sup>#4</sup>			NL <sup>#4</sup>																
Human Health - Intrusive - Direct Contact							82000 <sup>#5</sup>	62000 <sup>#5</sup>	85000 <sup>#5</sup>	120000 <sup>#5</sup>			1100 <sup>#5</sup>	120000 <sup>#5</sup>	85000 <sup>#5</sup>			130000 <sup>#5</sup>																
Human Health - Direct Contact - HIL-D							26000 <sup>#6</sup>	20000 <sup>#6</sup>	27000 <sup>#6</sup>	38000 <sup>#6</sup>			430 <sup>#6</sup>	99000 <sup>#6</sup>	27000 <sup>#6</sup>			81000 <sup>#6</sup>			3000 <sup>#11</sup>	900 <sup>#11</sup>		240000 <sup>#11</sup>	1500 <sup>#11</sup>		730 <sup>#11</sup>	6000 <sup>#11</sup>	10000 <sup>#11</sup>	400000 <sup>#11</sup>				
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)																				160 <sup>#1</sup>			870 <sup>#1</sup>	130 <sup>#1</sup>	1800 <sup>#1</sup>				160 <sup>#1</sup>		280 <sup>#1</sup>			
NEPM (2013) ESL - Commercial & Industrial (Coarse)							215		170	1700	3300		75	135	165			180																
NEPM (2013) ESL - Commercial & Industrial (Fine)										2500	6600		95	135	185			95																

Location Code	Field ID	Sample Code	Sampled Date	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	6	-	<1	<2	7	12	-	<0.1	8	<5	33	<0.5	<0.5
MA_MW01	MA_MW01_0.5	ES1324716001	11-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	17	-	<1	17	14	49	-	<0.1	22	<5	70	<0.5	<0.5
MA_MW03	MA_MW03_0.5	ES1324716003	11-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	8	-	<1	<2	<5	10	-	<0.1	9	<5	35	<0.5	<0.5
MA_MW05	MA_MW05_0.1	ES1324716007	12-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	18	-	<1	20	24	33	-	<0.1	77	<5	114	<0.5	<0.5
MA_MW07	MA_MW07_3.0	ES1325783008	25-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	9	-	<1	12	18	24	-	<0.1	33	<5	56	<0.5	<0.5
MA_MW07	MA_MW07_8.1	ES1326939002	25-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5	<5	<1	3	28	22	-	<0.1	8	<5	65	-	-	
MA_MW07	MA-MW07-0.1	ES1322662028	16-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	10	-	<1	10	16	19	-	<0.1	22	<5	53	<0.5	<0.5
MA_MW08	MA_MW08_0.2	ES1324716008	12-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	8	-	<1	10	<5	14	-	<0.1	8	<5	12	<0.5	<0.5
MA_MW08	MA_MW08_0.5	ES1324716009	12-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	21	-	<1	15	5	12	-	<0.1	<2	<5	9	<0.5	<0.5
MA_MW12	MA_MW12_2.8	ES1325900003	26-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	12	-	<1	6	16	20	-	<0.1	26	<5	55	<0.5	<0.5
MA_MW12	MA-MW12-0.1	ES1322662027	16-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	18	-	<1	12	15	21	-	<0.1	27	<5	40	<0.5	<0.5

Statistical Summary	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	11	0	11	11	11	11	11	0	11	11	11	11	10	10
Number of Results	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	11	0	11	11	11	11	11	0	11	11	11	11	10	10
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	9	9	11	0	0	10	0	11	0	0		
Minimum Concentration	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	99999	<1	<2	<5	10	99999	<0.1	<2	<5	9	<0.5	<0.5		
Maximum Concentration	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	21	0	<1	20	28	49	0	<0.1	77	<5	114	<0.5	<0.5		
Average Concentration	5	25	50	50	25	5	5	25	25	50	50	25	0.1	0.25	0.25	0.25	0.25	0.25	0.1	12		0.5	9.7	13	21		0.05	22	2.5	49	0.25	0.25				
Median Concentration	5	25	50	50	25	5	5	25	25	50	50	25	0.1	0.25	0.25	0.25	0.25	0.25	0.1	10		0.5	10	15	20		0.05	22	2.5	53	0.25	0.25				
Standard Deviation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.9		0	6.4	8.4	11		0	21	0	29	0	0				
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Number of Guideline Exceedances (Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

- Comments
- #1 NEPC (2010) Ecological Investigation Level Calculator
  - #2 CRC Care (2011) Intrusive Maintenance Workers, 2 to <4m, Sand Soils for Vapour Intrusion
  - #3 CRC Care (2011) Intrusive Maintenance Workers, 0 to <2m, Sand Soils for Vapour Intrusion
  - #4 CRC Care (2011) Intrusive Maintenance Workers, +4 m, Sand Soils for Vapour Intrusion
  - #5 CRC Care (2011) Intrusive Maintenance Workers for Direct Contact
  - #6 ASC NEPM (2013) HSL-D (Commercial/Industrial) for Direct Contact
  - #7 ASC NEPM (2013) HSL-D (Commercial/Industrial) 2 to <4m, Sand Soils for Vapour Intrusion
  - #8 ASC NEPM (2013) HSL-D (Commercial/Industrial) 1 to <2m, Sand Soils for Vapour Intrusion
  - #9 ASC NEPM (2013) HSL-D (Commercial/Industrial) 0 to <1m, Sand Soils for Vapour Intrusion
  - #10 ASC NEPM (2013) HSL-D (Commercial/Industrial) +4 m, Sand Soils for Vapour Intrusion
  - #11 ASC NEPM (2013) Health Investigation Level (HIL-D) Commercial/Industrial



Table 4a. AEC - MA Soil Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	PAH																		Phenols																		
	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Carcinogenic PAHs (as B(a)P TEQ (half LOB))	Carcinogenic PAHs (as B(a)P TEQ (LOB))	Naphthalene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	PAHs (Sum of total)	Carcinogenic PAHs (as BaP TEQ)	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,4-dimethylphenol	2,6-dichlorophenol	2-chlorophenol	2-methylphenol	2-nitrophenol	3-&4-methylphenol	4-chloro-3-methylphenol	Pentachlorophenol	Phenol	1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane		
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND								NL <sup>#9</sup>																													
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND								NL <sup>#8</sup>																													
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND								NL <sup>#7</sup>																													
Human Health - HSL-D - Vapour Intrusion + 4m SAND								NL <sup>#10</sup>																													
Human Health - Intrusive - Vapour Intrusion 0-<2m								NL <sup>#3</sup>																													
Human Health - Intrusive - Vapour Intrusion 2-<4m								NL <sup>#2</sup>																													
Human Health - Intrusive - Vapour Intrusion + 4m								NL <sup>#4</sup>																													
Human Health - Intrusive - Direct Contact								29000 <sup>#5</sup>																													
Human Health - Direct Contact - HIL-D								11000 <sup>#6</sup>									4000 <sup>#11</sup>	40 <sup>#11</sup>												660 <sup>#11</sup>	240000 <sup>#11</sup>						
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)								370 <sup>#1</sup>																													
NEPM (2013) ESL - Commercial & Industrial (Coarse)			1.4																																		
NEPM (2013) ESL - Commercial & Industrial (Fine)			1.4																																		

Location Code	Field ID	Sample Code	Sampled Date	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Carcinogenic PAHs (as B(a)P TEQ (half LOB))	Carcinogenic PAHs (as B(a)P TEQ (LOB))	Naphthalene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	PAHs (Sum of total)	Carcinogenic PAHs (as BaP TEQ)	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,4-dimethylphenol	2,6-dichlorophenol	2-chlorophenol	2-methylphenol	2-nitrophenol	3-&4-methylphenol	4-chloro-3-methylphenol	Pentachlorophenol	Phenol	1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane		
MA_MW01	MA_MW01_0.5	ES1324716001	11-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
MA_MW01	MA_MW01_2.6	ES1325783007	22-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MA_MW03	MA_MW03_0.5	ES1324716003	11-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MA_MW05	MA_MW05_0.1	ES1324716007	12-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MA_MW07	MA_MW07_3.0	ES1325783008	25-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MA_MW07	MA_MW07_8.1	ES1326939002	25-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MA_MW07	MA-MW07-0.1	ES1322662028	16-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MA_MW08	MA_MW08_0.2	ES1324716008	12-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MA_MW08	MA_MW08_0.5	ES1324716009	12-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MA_MW12	MA_MW12_2.8	ES1325900003	26-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MA_MW12	MA-MW12-0.1	ES1322662027	16-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Statistical Summary	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Carcinogenic PAHs (as B(a)P TEQ (half LOB))	Carcinogenic PAHs (as B(a)P TEQ (LOB))	Naphthalene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	PAHs (Sum of total)	Carcinogenic PAHs (as BaP TEQ)	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,4-dimethylphenol	2,6-dichlorophenol	2-chlorophenol	2-methylphenol	2-nitrophenol	3-&4-methylphenol	4-chloro-3-methylphenol	Pentachlorophenol	Phenol	1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane			
Number of Results	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
Number of Detects	0	0	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Maximum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Average Concentration	0.25	0.25	0.25	0.25	0.25	0.25	0.6	1.2	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Median Concentration	0.25	0.25	0.25	0.25	0.25	0.25	0.6	1.2	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Standard Deviation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

- Comments
- #1 NEPC (2010) Ecological Investigation Level Calculator
  - #2 CRC Care (2011) Intrusive Maintenance Workers, 2 to <4m, Sand Soils for Vapour Intr
  - #3 CRC Care (2011) Intrusive Maintenance Workers, 0 to <2m, Sand Soils for Vapour Intr
  - #4 CRC Care (2011) Intrusive Maintenance Workers, +4 m, Sand Soils for Vapour Intrusiv
  - #5 CRC Care (2011) Intrusive Maintenance Workers for Direct Contact
  - #6 ASC NEPM (2013) HSL-D (Commercial/Industrial) for Direct Contact
  - #7 ASC NEPM (2013) HSL-D (Commercial/Industrial) 2 to <4m, Sand Soils for Vapour Ir
  - #8 ASC NEPM (2013) HSL-D (Commercial/Industrial) 1 to <2m, Sand Soils for Vapour Ir
  - #9 ASC NEPM (2013) HSL-D (Commercial/Industrial) 0 to <1m, Sand Soils for Vapour Ir
  - #1







Table 4a. AEC - MA Soil Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	Halogenated Benzenes								Halogenated Hydrocarbons					Solvents				Polychlorinated Biphenyls			
	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	2-chlorotoluene	4-chlorotoluene	Bromobenzene	Chlorobenzene	1,2-dibromoethane	Bromomethane	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane	Methyl Ethyl Ketone	2-hexanone (MBK)	4-Methyl-2-pentanone	Carbon disulfide	Vinyl acetate	PCBs (Sum of total)	
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	5	0.5	5	5	5	5	0.5	5		0.1	
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND																					
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND																					
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND																					
Human Health - HSL-D - Vapour Intrusion + 4m SAND																					
Human Health - Intrusive - Vapour Intrusion 0-<2m																					
Human Health - Intrusive - Vapour Intrusion 2-<4m																					
Human Health - Intrusive - Vapour Intrusion + 4m																					
Human Health - Intrusive - Direct Contact																					
Human Health - Direct Contact - HIL-D																					7 <sup>#11</sup>
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)																					
NEPM (2013) ESL - Commercial & Industrial (Coarse)																					
NEPM (2013) ESL - Commercial & Industrial (Fine)																					

Location Code	Field ID	Sample Code	Sampled Date	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	2-chlorotoluene	4-chlorotoluene	Bromobenzene	Chlorobenzene	1,2-dibromoethane	Bromomethane	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane	Methyl Ethyl Ketone	2-hexanone (MBK)	4-Methyl-2-pentanone	Carbon disulfide	Vinyl acetate	PCBs (Sum of total)
MA_MW01	MA_MW01_0.5	ES1324716001	11-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
MA_MW01	MA_MW01_2.6	ES1325783007	22-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
MA_MW03	MA_MW03_0.5	ES1324716003	11-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
MA_MW05	MA_MW05_0.1	ES1324716007	12-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
MA_MW07	MA_MW07_3.0	ES1325783008	25-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
MA_MW07	MA_MW07_8.1	ES1326939002	25-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MA_MW07	MA-MW07-0.1	ES1322662028	16-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
MA_MW08	MA_MW08_0.2	ES1324716008	12-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
MA_MW08	MA_MW08_0.5	ES1324716009	12-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
MA_MW12	MA_MW12_2.8	ES1325900003	26-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
MA_MW12	MA-MW12-0.1	ES1322662027	16-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1

Statistical Summary																						
Number of Results	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<0.5	<5	<0.1
Maximum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<0.5	<5	<0.1
Average Concentration	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.5	2.5	0.25	2.5	2.5	2.5	0.25	2.5	0.05
Median Concentration	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.5	2.5	0.25	2.5	2.5	2.5	0.25	2.5	0.05
Standard Deviation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

- Comments**
- #1 NEPC (2010) Ecological Investigation Level Calculator
  - #2 CRC Care (2011) Intrusive Maintenance Workers, 2 to <4m, Sand Soils for Vapour Intr
  - #3 CRC Care (2011) Intrusive Maintenance Workers, 0 to <2m, Sand Soils for Vapour Intr
  - #4 CRC Care (2011) Intrusive Maintenance Workers, +4 m, Sand Soils for Vapour Intrusiv
  - #5 CRC Care (2011) Intrusive Maintenance Workers for Direct Contact
  - #6 ASC NEPM (2013) HSL-D (Commercial/Industrial) for Direct Contact
  - #7 ASC NEPM (2013) HSL-D (Commercial/Industrial) 2 to <4m, Sand Soils for Vapour Ir
  - #8 ASC NEPM (2013) HSL-D (Commercial/Industrial) 1 to <2m, Sand Soils for Vapour Ir
  - #9 ASC NEPM (2013) HSL-D (Commercial/Industrial) 0 to <1m, Sand Soils for Vapour Ir
  - #10 ASC NEPM (2013) HSL-D (Commercial/Industrial) +4 m, Sand Soils for Vapour Intr
  - #11 ASC NEPM (2013) Health Investigation Level (HIL-D) Commercial/Industrial



Table 4b. AEC - MB Soil Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony -0207423

	TRH											BTEX						Metals															
	TRH >C6-C9 Fraction	TRH >C10-C14 Fraction	TRH >C15-C28 Fraction	TRH >C29-C36 Fraction	TRH >C10-C36 Fraction	TRH >C6-C10 Fraction	TRH >C6-C10 less BTEX (F1)	TRH >C10-C16 Fraction	TRH >C10-C16 less Naphthalene (F2)	TRH >C16-C34 Fraction	TRH >C34-C40 Fraction	TRH >C10-C40 Fraction	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Total BTEX	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Selenium	Zinc	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	
EQL	10	50	100	100	50	10	10	50	50	100	100	50	0.2	0.5	0.5	0.5	0.5	0.5	0.2	5	1	2	5	5	0.1	2	5	5	0.5	0.5	0.5	0.5	
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND							260 <sup>#9</sup>	NL <sup>#9</sup>					3 <sup>#9</sup>	NL <sup>#9</sup>	NL <sup>#9</sup>			230 <sup>#9</sup>															
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND							370 <sup>#8</sup>	NL <sup>#8</sup>					3 <sup>#8</sup>	NL <sup>#8</sup>	NL <sup>#8</sup>																		
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND							630 <sup>#7</sup>	NL <sup>#7</sup>					3 <sup>#7</sup>	NL <sup>#7</sup>	NL <sup>#7</sup>																		
Human Health - HSL-D - Vapour Intrusion + 4m SAND							NL <sup>#10</sup>	NL <sup>#10</sup>					3 <sup>#10</sup>	NL <sup>#10</sup>	NL <sup>#10</sup>																		
Human Health - Intrusive - Vapour Intrusion 0-<2m							NL <sup>#3</sup>	NL <sup>#3</sup>					77 <sup>#3</sup>	NL <sup>#3</sup>	NL <sup>#3</sup>																		
Human Health - Intrusive - Vapour Intrusion 2-<4m							NL <sup>#2</sup>	NL <sup>#2</sup>					160 <sup>#2</sup>	NL <sup>#2</sup>	NL <sup>#2</sup>																		
Human Health - Intrusive - Vapour Intrusion + 4m							NL <sup>#4</sup>	NL <sup>#4</sup>					NL <sup>#4</sup>	NL <sup>#4</sup>	NL <sup>#4</sup>																		
Human Health - Intrusive - Direct Contact							82000 <sup>#5</sup>	62000 <sup>#5</sup>	85000 <sup>#5</sup>	120000 <sup>#5</sup>			1100 <sup>#5</sup>	120000 <sup>#5</sup>	85000 <sup>#5</sup>				130000 <sup>#5</sup>														
Human Health - Direct Contact - HIL-D							26000 <sup>#6</sup>	20000 <sup>#6</sup>	27000 <sup>#6</sup>	38000 <sup>#6</sup>			430 <sup>#6</sup>	99000 <sup>#6</sup>	27000 <sup>#6</sup>				81000 <sup>#6</sup>														
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)																				160 <sup>#1</sup>	900 <sup>#1</sup>	870 <sup>#1</sup>	130 <sup>#1</sup>	1800 <sup>#1</sup>		160 <sup>#1</sup>							
NEPM (2013) ESL - Commercial & Industrial (Coarse)							215		170	1700	3300		75	135	165				180														
NEPM (2013) ESL - Commercial & Industrial (Fine)										2500	6600		95	135	185				95														

Location Code	Field ID	Sample Code	Sampled Date	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	10	<1	9	16	28	<0.1	38	<5	59	<0.5	<0.5	<0.5	<0.5
MB_MW01	MB_MW01_0.2	ES1322146005	09-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	5	<1	4	10	12	<0.1	22	<5	40	<0.5	<0.5	<0.5	<0.5
MB_MW02	MB_MW02_15.7	ES1325900006	26-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	16	6	10	<0.1	10	<5	36	<0.5	<0.5	<0.5	<0.5
MB_MW02	MB_MW02_3.0	ES1325473002	20-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	0.5	0.5-0.75	0.5	18	<1	18	32	26	<0.1	74	<5	103	<0.5	<0.5	<0.5	<0.5
MB_MW03	D02_091013_1S	ES1322146011	09-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	<2	<5	8	<0.1	3	<5	8	<0.5	<0.5	<0.5	<0.5
MB_MW03	MB_MW03_0.2	ES1322146006	09-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	4	22	22	<0.1	23	<5	19	<0.5	<0.5	<0.5	<0.5
MB_MW03	MB_MW03_1.0	ES1322146007	09-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	6	<1	4	7	11	<0.1	10	<5	20	<0.5	<0.5	<0.5	<0.5
MB_MW03	MB_MW03_3.0	ES1325218006	18-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	6	<1	<2	<5	12	<0.1	3	<5	7	<0.5	<0.5	<0.5	<0.5
MB_MW04	MB_MW04_0.5	ES1322146002	08-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	17	<1	15	25	30	<0.1	71	<5	101	<0.5	<0.5	<0.5	<0.5
MB_MW04	MB_MW04_3.5	ES1325218009	18-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	19	<1	24	23	21	<0.1	80	<5	136	<0.5	<0.5	<0.5	<0.5
MB_MW05	MB_MW05_0.5	ES1322146003	09-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	10	<1	10	15	18	<0.1	28	<5	42	<0.5	<0.5	<0.5	<0.5
MB_MW05	MB_MW05_3.5	ES1325473001	19-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	5	<1	15	14	24	<0.1	7	<5	8	<0.5	<0.5	<0.5	<0.5

Statistical Summary	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	10	<1	9	16	28	<0.1	38	<5	59	<0.5	<0.5	<0.5	<0.5		
Number of Results	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Minimum Concentration	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	<2	<5	8	<0.1	3	<5	7	<0.5	<0.5	<0.5	<0.5
Maximum Concentration	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	0.5	0.75	0.5	19	<1	24	32	30	<0.1	80	<5	136	<0.5	<0.5	<0.5	<0.5		
Average Concentration	5	25	50	50	25	5	5	25	25	50	50	25	0.1	0.25	0.25	0.25	0.25	0.27	0.28	0.13	8.6	0.5	10	15	19	0.05	31	2.5	48	0.25	0.25	0.25	0.25	
Median Concentration	5	25	50	50	25	5	5	25	25	50	50	25	0.1	0.25	0.25	0.25	0.25	0.25	0.1	6	0.5	9.5	14.5	19.5	0.05	22.5	2.5	38	0.25	0.25	0.25	0.25		
Standard Deviation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.072	0.11	0.12	0.12	6.2	0	7.5	9.5	7.7	0	29	0	43	0	0	0	0		
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

- Comments
- #1 NEPC (2010) Ecological Investigation Level Calculator
  - #2 CRC Care (2011) Intrusive Maintenance Workers, 2 to <4m, Sand Soils for Vapour Intrusion
  - #3 CRC Care (2011) Intrusive Maintenance Workers, 0 to <2m, Sand Soils for Vapour Intrusion
  - #4 CRC Care (2011) Intrusive Maintenance Workers, +4 m, Sand Soils for Vapour Intrusion
  - #5 CRC Care (2011) Intrusive Maintenance Workers for Direct Contact
  - #6 ASC NEPM (2013) HSL-D (Commercial/Industrial) for Direct Contact
  - #7 ASC NEPM (2013) HSL-D (Commercial/Industrial) 2 to <4m, Sand Soils for Vapour Intrusion
  - #8 ASC NEPM (2013) HSL-D (Commercial/Industrial) 1 to <2m, Sand Soils for Vapour Intrusion
  - #9 ASC NEPM (2013) HSL-D (Commercial/Industrial) 0 to <1m, Sand Soils for Vapour Intrusion
  - #10 ASC NEPM (2013) HSL-D (Commercial/Industrial) +4 m, Sand Soils for Vapour Intrusion
  - #11 ASC NEPM (2013) Health Investigation Level (HIL-D) Commercial/Industrial







Table 4c. AEC - MC Soil Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	TRH											BTEX							Metals															
	TRH >C6-C9 Fraction	TRH >C10-C14 Fraction	TRH >C15-C28 Fraction	TRH >C29-C36 Fraction	TRH >C10-C36 Fraction	TRH >C6-C10 Fraction	TRH >C6-C10 less BTEX (F1)	TRH >C10-C16 Fraction	TRH >C10-C16 less Naphthalene (F2)	TRH >C16-C34 Fraction	TRH >C34-C40 Fraction	TRH >C10-C40 Fraction	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Total BTEX	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Selenium	Zinc	Acenaphthene	Acenaphthylene	Anthracene			
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	10	50	100	100	50	10	10	50	100	100	50	0.2	0.5	0.5	0.5	0.5	0.5	0.5	0.2	5	1	2	5	5	0.1	2	5	5	0.5	0.5	0.5			
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND							260 <sup>#9</sup>	NL <sup>#9</sup>				3 <sup>#9</sup>	NL <sup>#9</sup>	NL <sup>#9</sup>				230 <sup>#9</sup>																
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND							370 <sup>#8</sup>	NL <sup>#8</sup>				3 <sup>#8</sup>	NL <sup>#8</sup>	NL <sup>#8</sup>				NL <sup>#8</sup>																
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND							630 <sup>#7</sup>	NL <sup>#7</sup>				3 <sup>#7</sup>	NL <sup>#7</sup>	NL <sup>#7</sup>				NL <sup>#7</sup>																
Human Health - HSL-D - Vapour Intrusion + 4m SAND							NL <sup>#10</sup>	NL <sup>#10</sup>				3 <sup>#10</sup>	NL <sup>#10</sup>	NL <sup>#10</sup>				NL <sup>#10</sup>																
Human Health - Intrusive - Vapour Intrusion 0-<2m							NL <sup>#3</sup>	NL <sup>#3</sup>				77 <sup>#3</sup>	NL <sup>#3</sup>	NL <sup>#3</sup>				NL <sup>#3</sup>																
Human Health - Intrusive - Vapour Intrusion 2-<4m							NL <sup>#2</sup>	NL <sup>#2</sup>				160 <sup>#2</sup>	NL <sup>#2</sup>	NL <sup>#2</sup>				NL <sup>#2</sup>																
Human Health - Intrusive - Vapour Intrusion + 4m							NL <sup>#4</sup>	NL <sup>#4</sup>				NL <sup>#4</sup>	NL <sup>#4</sup>	NL <sup>#4</sup>				NL <sup>#4</sup>																
Human Health - Intrusive - Direct Contact							82000 <sup>#5</sup>	62000 <sup>#5</sup>	85000 <sup>#5</sup>	120000 <sup>#5</sup>	1100 <sup>#5</sup>	120000 <sup>#5</sup>	85000 <sup>#5</sup>				130000 <sup>#5</sup>																	
Human Health - Direct Contact - HIL-D							26000 <sup>#6</sup>	20000 <sup>#6</sup>	27000 <sup>#6</sup>	38000 <sup>#6</sup>	430 <sup>#6</sup>	99000 <sup>#6</sup>	27000 <sup>#6</sup>				81000 <sup>#6</sup>			3000 <sup>#11</sup>	900 <sup>#11</sup>	240000 <sup>#11</sup>	1500 <sup>#11</sup>	730 <sup>#11</sup>	6000 <sup>#11</sup>	10000 <sup>#11</sup>	400000 <sup>#11</sup>							
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)																				160 <sup>#1</sup>		870 <sup>#1</sup>	130 <sup>#1</sup>	1800 <sup>#1</sup>		160 <sup>#1</sup>								
NEPM (2013) ESL - Commercial & Industrial (Coarse)							215	170	1700	3300	75	135	165				180																	
NEPM (2013) ESL - Commercial & Industrial (Fine)									2500	6600	95	135	185				95																	

Location Code	Field ID	Sample Code	Sampled Date	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	9	14	28	<0.1	18	<5	109	<0.5	<0.5	<0.5
MC_MW01	MC_MW01_0.2	ES1323862023	30-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	9	14	28	<0.1	18	<5	109	<0.5	<0.5	<0.5
MC_MW01	MC_MW01_3.5	ES1325472010	20-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	15	9	16	<0.1	4	<5	43	<0.5	<0.5	<0.5
MC_MW01	MC_MW01_5.5	ES1325472011	20-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	8	<1	16	8	12	<0.1	15	<5	40	<0.5	<0.5	<0.5
MC_MW02	MC_MW02_1.1	ES1322434015	11-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	8	<1	7	16	17	<0.1	28	<5	56	<0.5	<0.5	<0.5
MC_MW02	MC_MW02_2.0	ES1325472006	20-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	17	<1	13	26	20	<0.1	48	<5	68	<0.5	<0.5	<0.5
MC_MW02	MC_MW02_3.0	ES1325472007	20-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	2	8	11	<0.1	7	<5	29	<0.5	<0.5	<0.5
MC_MW03	MC_MW03_0.7	ES1322434012	11-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	7	<1	4	8	18	<0.1	18	<5	44	<0.5	<0.5	<0.5
MC_MW03	MC_MW03_1.0	ES1322434013	11-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	<0.5	<0.5	<0.5	<0.5	<1	-	-	-	-	-	-	-	-	-	-	-	-	-
MC_MW03	MC_MW03_3.6	ES1325472004	20-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	15	<1	17	20	18	<0.1	53	<5	70	<0.5	<0.5	<0.5
MC_MW04	MC_MW04_0.15	ES1323862013	29-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	110	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	13	<1	9	24	24	<0.1	41	<5	157	<0.5	<0.5	<0.5
MC_MW04	MC_MW04_3.0	ES1323862031	31-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	9	<1	6	12	16	<0.1	19	<5	94	<0.5	<0.5	<0.5

Statistical Summary

Number of Results	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	11	11	11	11	11	11	10	10	10	10	10	10	10	10	10	10	10	10	10
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	7	0	10	10	10	0	10	0	10	0	0	0
Minimum Concentration	<10	<50	<100	<100	<50	<10	<10	<50	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	2	8	11	<0.1	4	<5	29	<0.5	<0.5	<0.5	
Maximum Concentration	<10	<50	<100	<100	<50	<10	<10	<50	<50	<50	110	<100	110	<0.2	<0.5	<0.5	<0.5	<0.5	<1	<0.2	17	<1	17	26	28	<0.1	53	<5	157	<0.5	<0.5	<0.5		
Average Concentration	5	25	50	50	25	5	5	25	25	56	50	34	0.1	0.25	0.25	0.25	0.25	0.27	0.1	8.5	0.5	9.8	15	18	0.05	25	2.5	71	0.25	0.25	0.25			
Median Concentration	5	25	50	50	25	5	5	25	25	50	50	25	0.1	0.25	0.25	0.25	0.25	0.25	0.1	8	0.5	9	13	17.5	0.05	18.5	2.5	62	0.25	0.25	0.25			
Standard Deviation	0	0	0	0	0	0	0	0	0	19	0	27	0	0	0	0	0	0.075	0	5.2	0	5.2	6.8	5.1	0	17	0	39	0	0	0	0		
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Number of Guideline Exceedances (Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Comments

- #1 NEPC (2010) Ecological Investigation Level Calculator
- #2 CRC Care (2011) Intrusive Maintenance Workers, 2 to <4m, Sand Soils for Vapour Intrusion
- #3 CRC Care (2011) Intrusive Maintenance Workers, 0 to <2m, Sand Soils for Vapour Intrusion
- #4 CRC Care (2011) Intrusive Maintenance Workers, +4 m, Sand Soils for Vapour Intrusion
- #5 CRC Care (2011) Intrusive Maintenance Workers for Direct Contact
- #6 ASC NEPM (2013) HSL-D (Commercial/Industrial) for Direct Contact
- #7 ASC NEPM (2013) HSL-D (Commercial/Industrial) 2 to <4m, Sand Soils for Vapour Intrusion
- #8 ASC NEPM (2013) HSL-D (Commercial/Industrial) 1 to <2m, Sand Soils for Vapour Intrusion
- #9 ASC NEPM (2013) HSL-D (Commercial/Industrial) 0 to <1m, Sand Soils for Vapour Intrusion
- #10 ASC NEPM (2013) HSL-D (Commercial/Industrial) +4 m, Sand Soils for Vapour Intrusion
- #11 ASC NEPM (2013) Health Investigation Level (HIL-D) Commercial/Industrial









Table 4c. AEC - MC Soil Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	Halogenated Benzenes								Halogenated Hydrocarbons					Solvents					Polychlorinated Biphenyls		
	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	2-chlorotoluene	4-chlorotoluene	Bromobenzene	Chlorobenzene	1,2-dibromoethane	Bromomethane	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane	Methyl Ethyl Ketone	2-hexanone (MBK)	4-Methyl-2-pentanone	Carbon disulfide	Vinyl acetate	PCBs (Sum of total)	
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	5	0.5	5	5	5	5	0.5	5		0.1	
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND																					
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND																					
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND																					
Human Health - HSL-D - Vapour Intrusion + 4m SAND																					
Human Health - Intrusive - Vapour Intrusion 0-<2m																					
Human Health - Intrusive - Vapour Intrusion 2-<4m																					
Human Health - Intrusive - Vapour Intrusion + 4m																					
Human Health - Intrusive - Direct Contact																					
Human Health - Direct Contact - HIL-D																					7#11
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)																					
NEPM (2013) ESL - Commercial & Industrial (Coarse)																					
NEPM (2013) ESL - Commercial & Industrial (Fine)																					

Location Code	Field ID	Sample Code	Sampled Date	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	2-chlorotoluene	4-chlorotoluene	Bromobenzene	Chlorobenzene	1,2-dibromoethane	Bromomethane	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane	Methyl Ethyl Ketone	2-hexanone (MBK)	4-Methyl-2-pentanone	Carbon disulfide	Vinyl acetate	PCBs (Sum of total)
MC_MW01	MC_MW01_0.2	ESI323862023	30-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MC_MW01	MC_MW01_3.5	ESI325472010	20-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.1
MC_MW01	MC_MW01_5.5	ESI325472011	20-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.1
MC_MW02	MC_MW02_1.1	ESI322434015	11-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MC_MW02	MC_MW02_2.0	ESI325472006	20-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.1
MC_MW02	MC_MW02_3.0	ESI325472007	20-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.1
MC_MW03	MC_MW03_0.7	ESI322434012	11-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MC_MW03	MC_MW03_1.0	ESI322434013	11-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.1
MC_MW03	MC_MW03_3.6	ESI325472004	20-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.1
MC_MW04	MC_MW04_0.15	ESI323862013	29-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.1
MC_MW04	MC_MW04_3.0	ESI323862031	31-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.1

Statistical Summary

Number of Results	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Maximum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Average Concentration	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Median Concentration	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Standard Deviation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments

- #1 NEPC (2010) Ecological Investigation Level Calculator
- #2 CRC Care (2011) Intrusive Maintenance Workers, 2 to <4m, Sand Soils for Vapour In
- #3 CRC Care (2011) Intrusive Maintenance Workers, 0 to <2m, Sand Soils for Vapour In
- #4 CRC Care (2011) Intrusive Maintenance Workers, +4 m, Sand Soils for Vapour Intrus
- #5 CRC Care (2011) Intrusive Maintenance Workers for Direct Contact
- #6 ASC NEPM (2013) HSL-D (Commercial/Industrial) for Direct Contact
- #7 ASC NEPM (2013) HSL-D (Commercial/Industrial) 2 to <4m, Sand Soils for Vapour
- #8 ASC NEPM (2013) HSL-D (Commercial/Industrial) 1 to <2m, Sand Soils for Vapour
- #9 ASC NEPM (2013) HSL-D (Commercial/Industrial) 0 to <1m, Sand Soils for Vapour
- #10 ASC NEPM (2013) HSL-D (Commercial/Industrial) +4 m, Sand Soils for Vapour Int
- #11 ASC NEPM (2013) Health Investigation Level (HIL-D) Commercial/Industrial



Table 4d. AEC - MD Soil Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	TRH												BTEX							Metals										
	TRH > C6-C9 Fraction	TRH > C10-C14 Fraction	TRH > C15-C28 Fraction	TRH > C29-C36 Fraction	TRH > C10-C36 Fraction	TRH > C6-C10 Fraction	TRH > C6-C10 less BTEX (F1)	TRH > C10-C16 Fraction	TRH > C10-C16 less Naphthalene (F2)	TRH > C16-C34 Fraction	TRH > C34-C40 Fraction	TRH > C10-C40 Fraction	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Total BTEX	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Selenium	Zinc	Acenaphthene	
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
EQI	10	50	100	100	50	10	10	50	50	100	100	50	0.2	0.5	0.5	0.5	0.5	0.5	0.2	5	1	2	5	5	0.1	2	5	5	0.5	
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND							260 <sup>#9</sup>	NL <sup>#9</sup>					3 <sup>#9</sup>	NL <sup>#9</sup>	NL <sup>#9</sup>			230 <sup>#9</sup>												
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND							370 <sup>#8</sup>	NL <sup>#8</sup>					3 <sup>#8</sup>	NL <sup>#8</sup>	NL <sup>#8</sup>			NL <sup>#8</sup>												
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND							630 <sup>#7</sup>	NL <sup>#7</sup>					3 <sup>#7</sup>	NL <sup>#7</sup>	NL <sup>#7</sup>			NL <sup>#7</sup>												
Human Health - HSL-D - Vapour Intrusion + 4m SAND							NL <sup>#10</sup>	NL <sup>#10</sup>					3 <sup>#10</sup>	NL <sup>#10</sup>	NL <sup>#10</sup>			NL <sup>#10</sup>												
Human Health - Intrusive - Vapour Intrusion 0-<2m							NL <sup>#3</sup>	NL <sup>#3</sup>					77 <sup>#3</sup>	NL <sup>#3</sup>	NL <sup>#3</sup>			NL <sup>#3</sup>												
Human Health - Intrusive - Vapour Intrusion 2-<4m							NL <sup>#2</sup>	NL <sup>#2</sup>					160 <sup>#2</sup>	NL <sup>#2</sup>	NL <sup>#2</sup>			NL <sup>#2</sup>												
Human Health - Intrusive - Vapour Intrusion + 4m							NL <sup>#4</sup>	NL <sup>#4</sup>					NL <sup>#4</sup>	NL <sup>#4</sup>	NL <sup>#4</sup>			NL <sup>#4</sup>												
Human Health - Intrusive - Direct Contact							82000 <sup>#5</sup>	62000 <sup>#5</sup>	85000 <sup>#5</sup>	120000 <sup>#5</sup>			1100 <sup>#5</sup>	120000 <sup>#5</sup>	85000 <sup>#5</sup>			130000 <sup>#5</sup>												
Human Health - Direct Contact - HIL-D							26000 <sup>#6</sup>	20000 <sup>#6</sup>	27000 <sup>#6</sup>	38000 <sup>#6</sup>			430 <sup>#6</sup>	99000 <sup>#6</sup>	27000 <sup>#6</sup>			81000 <sup>#6</sup>			3000 <sup>#11</sup>	900 <sup>#11</sup>	240000 <sup>#11</sup>	1500 <sup>#11</sup>	730 <sup>#11</sup>	6000 <sup>#11</sup>	10000 <sup>#11</sup>	400000 <sup>#11</sup>		
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)																				160 <sup>#1</sup>		870 <sup>#1</sup>	130 <sup>#1</sup>	1800 <sup>#1</sup>		730 <sup>#11</sup>	6000 <sup>#11</sup>	10000 <sup>#11</sup>	400000 <sup>#11</sup>	
NEPM (2013) ESL - Commercial & Industrial (Coarse)							215	170	1700	3300			75	135	165			180												
NEPM (2013) ESL - Commercial & Industrial (Fine)									2500	6600			95	135	185			95												

Location Code	Field ID	Sample Code	Sampled Date	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	6	<1	8	13	15	<0.1	9	<5	35	<0.5
MD_MW01	MD_MW01_1.0	ES1322434002	10-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	12	<1	7	21	21	<0.1	22	<5	96	<0.5
MD_MW01	MD_MW01_2.0	ES1323862027	30-Oct-13	<10	<50	120	<100	120	<10	<10	<50	<50	140	<100	140	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	12	<1	7	21	21	<0.1	22	<5	96	<0.5
MD_MW02	MD_MW02_1.0	ES1324471006	11-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	9	<1	8	10	14	<0.1	7	<5	27	<0.5
MD_MW03	MD_MW03_0.3	ES1324471002	11-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	5	<1	4	15	15	<0.1	8	<5	34	<0.5
MD_MW03	MD_MW03_2.0	ES1325970010	27-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	7	<1	8	10	26	<0.1	3	<5	13	<0.5
MD_MW03	MD_MW03_3.8	ES1325970011	27-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	15	<1	12	22	42	<0.1	25	<5	47	<0.5
MD_MW04	MD_MW04_1.2	ES1323862022	30-Oct-13	26	1420	3170	<100	4590	58	56	2490	2480	2040	<100	4530	<0.2	<0.5	<0.5	0.7	1.8	2.5	2.5	<5	<1	4	16	20	<0.1	15	<5	98	<0.5
MD_MW04	MD_MW04_3.0	ES1324470033	07-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	13	<1	17	20	20	<0.1	42	<5	70	<0.5

Statistical Summary

Number of Results	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Number of Detects	1	1	2	0	2	1	1	1	1	1	2	0	2	0	0	0	0	1	1	1	1	7	0	8	8	8	8	0	8	0	8	0	
Minimum Concentration	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	4	10	14	<0.1	3	<5	13	<0.5		
Maximum Concentration	26	1420	3170	<100	4590	58	56	2490	2480	2040	<100	4530	<0.2	<0.5	<0.5	0.7	1.8	2.5	2.5	15	<1	17	22	42	<0.1	42	<5	98	<0.5				
Average Concentration	7.6	199	449	50	608	12	11	333	332	310	50	603	0.1	0.25	0.25	0.31	0.44	0.53	0.4	8.7	0.5	8.5	16	22	0.05	16	2.5	53	0.25				
Median Concentration	5	25	50	50	25	5	5	25	25	50	50	25	0.1	0.25	0.25	0.25	0.25	0.25	0.1	8	0.5	8	15.5	20	0.05	12	2.5	41	0.25				
Standard Deviation	7.4	493	1100	0	1610	19	18	872	868	700	0	1587	0	0	0	0.16	0.55	0.8	0.85	4.3	0	4.3	4.8	9.1	0	13	0	32	0				
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

Comments

- #1 NEPC (2010) Ecological Investigation Level Calculator
- #2 CRC Care (2011) Intrusive Maintenance Workers, 2 to <4m, Sand Soils for Vapour Intrusion
- #3 CRC Care (2011) Intrusive Maintenance Workers, 0 to <2m, Sand Soils for Vapour Intrusion
- #4 CRC Care (2011) Intrusive Maintenance Workers, +4 m, Sand Soils for Vapour Intrusion
- #5 CRC Care (2011) Intrusive Maintenance Workers for Direct Contact
- #6 ASC NEPM (2013) HSL-D (Commercial/Industrial) for Direct Contact
- #7 ASC NEPM (2013) HSL-D (Commercial/Industrial) 2 to <4m, Sand Soils for Vapour Intrusion
- #8 ASC NEPM (2013) HSL-D (Commercial/Industrial) 1 to <2m, Sand Soils for Vapour Intrusion
- #9 ASC NEPM (2013) HSL-D (Commercial/Industrial) 0 to <1m, Sand Soils for Vapour Intrusion
- #10 ASC NEPM (2013) HSL-D (Commercial/Industrial) +4 m, Sand Soils for Vapour Intrusion
- #11 ASC NEPM (2013) Health Investigation Level (HIL-D) Commercial/Industrial





Table 4d. AEC - MD Soil Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	PAH																		Phenols																	
	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Carcinogenic PAHs (as B(a)P TEQ (half LOR))	Carcinogenic PAHs (as B(a)P TEQ (LOR))	Naphthalene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	PAHs (Sum of total)	Carcinogenic PAHs (as BaP TEQ)	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,4-dimethylphenol	2,6-dichlorophenol	2-chlorophenol	2-methylphenol	2-nitrophenol	3,4-methylphenol	4-chloro-3-methylphenol	Pentachlorophenol	Phenol	1,1,2-tetrachloroethane	1,1,1-trichloroethane			
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	2	0.5	0.5	0.5			
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND									NL <sup>#9</sup>																											
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND									NL <sup>#8</sup>																											
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND									NL <sup>#7</sup>																											
Human Health - HSL-D - Vapour Intrusion + 4m SAND									NL <sup>#10</sup>																											
Human Health - Intrusive - Vapour Intrusion 0-<2m									NL <sup>#3</sup>																											
Human Health - Intrusive - Vapour Intrusion 2-<4m									NL <sup>#2</sup>																											
Human Health - Intrusive - Vapour Intrusion + 4m									NL <sup>#4</sup>																											
Human Health - Intrusive - Direct Contact									29000 <sup>#5</sup>																											
Human Health - Direct Contact - HIL-D									11000 <sup>#6</sup>									4000 <sup>#11</sup>	40 <sup>#11</sup>														660 <sup>#11</sup>	240000 <sup>#11</sup>		
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)									370 <sup>#1</sup>																											
NEPM (2013) ESL - Commercial & Industrial (Coarse)				1.4																																
NEPM (2013) ESL - Commercial & Industrial (Fine)				1.4																																

Location Code	Field ID	Sample Code	Sampled Date	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Carcinogenic PAHs (as B(a)P TEQ (half LOR))	Carcinogenic PAHs (as B(a)P TEQ (LOR))	Naphthalene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	PAHs (Sum of total)	Carcinogenic PAHs (as BaP TEQ)	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,4-dimethylphenol	2,6-dichlorophenol	2-chlorophenol	2-methylphenol	2-nitrophenol	3,4-methylphenol	4-chloro-3-methylphenol	Pentachlorophenol	Phenol	1,1,2-tetrachloroethane	1,1,1-trichloroethane			
MD_MW01	MD_MW01_1.0	ES1322434002	10-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
MD_MW01	MD_MW01_2.0	ES1323862027	30-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	0.7	<0.5	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	
MD_MW02	MD_MW02_1.0	ES1324471006	11-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
MD_MW03	MD_MW03_0.3	ES1324471002	11-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
MD_MW03	MD_MW03_2.0	ES1325970010	27-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
MD_MW03	MD_MW03_3.8	ES1325970011	27-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
MD_MW04	MD_MW04_1.2	ES1323862022	30-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	5-9.8	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	5.7	<0.5	16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MD_MW04	MD_MW04_3.0	ES1324470033	07-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	

Statistical Summary																																						
Number of Results	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	
Number of Detects	0	0	0	0	0	0	0	0	8	8	1	0	0	2	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Maximum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	9.8	<0.5	<0.5	0.5	<0.5	<0.5	5.7	<0.5	16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Average Concentration	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.6	1.2	1.1	0.25	0.25	0.31	0.25	0.25	0.99	0.25	2.3	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	
Median Concentration	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.6	1.2	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	
Standard Deviation	0	0	0	0	0	0	0	0	0	2.5	0	0	0.12	0	0	1.9	0	5.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Comments  
 #1 NEPC (2010) Ecological Investigation Level Calculator  
 #2 CRC Care (2011) Intrusive Maintenance Workers, 2 to <4m, Sand Soils for Vapour Int  
 #3 CRC Care (2011) Intrusive Maintenance Workers, 0 to <2m, Sand Soils for Vapour Int  
 #4 CRC Care (2011) Intrusive Maintenance Workers, +4 m, Sand Soils for Vapour Intrusi  
 #5 CRC Care (2011) Intrusive Maintenance Workers for Direct Contact  
 #6 ASC NEPM (2013) HSL-D (Commercial/Industrial) for Direct Contact  
 #7 ASC NEPM (2013) HSL-D (Commercial/Industrial) 2 to <4m, Sand Soils for Vapour I  
 #8 ASC NEPM (2013) HSL-D (Commercial/Industrial) 1 to <2m, Sand Soils for Vapour I  
 #9 ASC NEPM (2013) HSL-D (Commercial/Industrial) 0 to <1m, Sand Soils for Vapour I  
 #10 ASC NEPM (2013) HSL-D (Commercial/Industrial) +4 m, Sand Soils for Vapour Int  
 #11 ASC NEPM (2013) Health Investigation Level (HIL-D) Commercial/Industrial



Table 4d. AEC - MD Soil Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	Chlorinated Hydrocarbons																										VOCs											
	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,1-dichloroethene	1,1-dichloropropene	1,2,3-trichloropropane	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	2,2-dichloropropane	Bromodichloromethane	Bromoform	Carbon tetrachloride	Chlorodibromomethane	Chloroethane	Chloroform	Chloromethane	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Dibromomethane	Hexachlorobutadiene	Trichloroethene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Vinyl chloride	cis-1,4-Dichloro-2-butene	Pentachloroethane	trans-1,4-Dichloro-2-butene	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	Isopropylbenzene	n-butylbenzene				
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	0.5	5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND																																						
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND																																						
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND																																						
Human Health - HSL-D - Vapour Intrusion + 4m SAND																																						
Human Health - Intrusive - Vapour Intrusion 0-<2m																																						
Human Health - Intrusive - Vapour Intrusion 2-<4m																																						
Human Health - Intrusive - Vapour Intrusion + 4m																																						
Human Health - Intrusive - Direct Contact																																						
Human Health - Direct Contact - HIL-D																																						
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)																																						
NEPM (2013) ESL - Commercial & Industrial (Coarse)																																						
NEPM (2013) ESL - Commercial & Industrial (Fine)																																						

Location Code	Field ID	Sample Code	Sampled Date	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,1-dichloroethene	1,1-dichloropropene	1,2,3-trichloropropane	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	2,2-dichloropropane	Bromodichloromethane	Bromoform	Carbon tetrachloride	Chlorodibromomethane	Chloroethane	Chloroform	Chloromethane	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Dibromomethane	Hexachlorobutadiene	Trichloroethene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Vinyl chloride	cis-1,4-Dichloro-2-butene	Pentachloroethane	trans-1,4-Dichloro-2-butene	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	Isopropylbenzene	n-butylbenzene		
MD_MW01	MD_MW01_1.0	ES1322434002	10-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
MD_MW01	MD_MW01_2.0	ES1323862027	30-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MD_MW02	MD_MW02_1.0	ES1324471006	11-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
MD_MW03	MD_MW03_0.3	ES1324471002	11-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
MD_MW03	MD_MW03_2.0	ES1325970010	27-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
MD_MW03	MD_MW03_3.8	ES1325970011	27-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
MD_MW04	MD_MW04_1.2	ES1323862022	30-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.8	1.8	<0.5	1.1	
MD_MW04	MD_MW04_3.0	ES1324470033	07-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	

Statistical Summary																																							
Number of Results	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7		
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
Minimum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Maximum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.8	1.8	<0.5	1.1		
Average Concentration	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.47	0.47	0.25	0.37		
Median Concentration	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25		
Standard Deviation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.59	0.59	0	0.32		
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

- Comments
- #1 NEPC (2010) Ecological Investigation Level Calculator
  - #2 CRC Care (2011) Intrusive Maintenance Workers, 2 to <4m, Sand Soils for Vapour Int
  - #3 CRC Care (2011) Intrusive Maintenance Workers, 0 to <2m, Sand Soils for Vapour Int
  - #4 CRC Care (2011) Intrusive Maintenance Workers, +4 m, Sand Soils for Vapour Intrusi
  - #5 CRC Care (2011) Intrusive Maintenance Workers for Direct Contact
  - #6 ASC NEPM (2013) HSL-D (Commercial/Industrial) for Direct Contact
  - #7 ASC NEPM (2013) HSL-D (Commercial/Industrial) 2 to <4m, Sand Soils for Vapour I
  - #8 ASC NEPM (2013) HSL-D (Commercial/Industrial) 1 to <2m, Sand Soils for Vapour I
  - #9 ASC NEPM (2013) HSL-D (Commercial/Industrial) 0 to <1m, Sand Soils for Vapour I
  - #10 ASC NEPM (2013) HSL-D (Commercial/Industrial) +4 m, Sand Soils for Vapour Intr
  - #11 ASC NEPM (2013) Health Investigation Level (HIL-D) Commercial/Industrial



Table 4d. AEC - MD Soil Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	MAH					Halogenated Benzenes								Halogenated Hydrocarbons					Solvents					Polychlorinated Biphenyls	
	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	Styrene	tert-butylbenzene	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	p-chlorotoluene	4-chlorotoluene	Bromobenzene	Chlorobenzene	1,2-dibromoethane	Bromomethane	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane	Methyl Ethyl Ketone	2-hexanone (MBK)	4-Methyl-2-pentanone	Carbon disulfide	Vinyl acetate	PCBs (Sum of total)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	5	5	5	5	5	5	5	0.5	5	0.1
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND																									
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND																									
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND																									
Human Health - HSL-D - Vapour Intrusion + 4m SAND																									
Human Health - Intrusive - Vapour Intrusion 0-<2m																									
Human Health - Intrusive - Vapour Intrusion 2-<4m																									
Human Health - Intrusive - Vapour Intrusion + 4m																									
Human Health - Intrusive - Direct Contact																									
Human Health - Direct Contact - HIL-D																									7 <sup>#11</sup>
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)																									
NEPM (2013) ESL - Commercial & Industrial (Coarse)																									
NEPM (2013) ESL - Commercial & Industrial (Fine)																									

Location Code	Field ID	Sample Code	Sampled Date	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	Styrene	tert-butylbenzene	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	p-chlorotoluene	4-chlorotoluene	Bromobenzene	Chlorobenzene	1,2-dibromoethane	Bromomethane	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane	Methyl Ethyl Ketone	2-hexanone (MBK)	4-Methyl-2-pentanone	Carbon disulfide	Vinyl acetate	PCBs (Sum of total)
MD_MW01	MD_MW01_1.0	ES1322434002	10-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
MD_MW01	MD_MW01_2.0	ES1323862027	30-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MD_MW02	MD_MW02_1.0	ES1324471006	11-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	-
MD_MW03	MD_MW03_0.3	ES1324471002	11-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	-
MD_MW03	MD_MW03_2.0	ES1325970010	27-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	-
MD_MW03	MD_MW03_3.8	ES1325970011	27-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	-
MD_MW04	MD_MW04_1.2	ES1323862022	30-Oct-13	1	<0.5	1.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
MD_MW04	MD_MW04_3.0	ES1324470033	07-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	-

Statistical Summary

Number of Results	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	2
Number of Detects	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1	
Maximum Concentration	1	<0.5	1.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1	
Average Concentration	0.36	0.25	0.43	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.5	2.5	0.25	2.5	2.5	2.5	2.5	0.25	2.5		
Median Concentration	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.5	2.5	0.25	2.5	2.5	2.5	2.5	0.25	2.5	0.05	
Standard Deviation	0.28	0	0.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Comments

- #1 NEPC (2010) Ecological Investigation Level Calculator
- #2 CRC Care (2011) Intrusive Maintenance Workers, 2 to <4m, Sand Soils for Vapour Int
- #3 CRC Care (2011) Intrusive Maintenance Workers, 0 to <2m, Sand Soils for Vapour Int
- #4 CRC Care (2011) Intrusive Maintenance Workers, +4 m, Sand Soils for Vapour Intrusi
- #5 CRC Care (2011) Intrusive Maintenance Workers for Direct Contact
- #6 ASC NEPM (2013) HSL-D (Commercial/Industrial) for Direct Contact
- #7 ASC NEPM (2013) HSL-D (Commercial/Industrial) 2 to <4m, Sand Soils for Vapour I
- #8 ASC NEPM (2013) HSL-D (Commercial/Industrial) 1 to <2m, Sand Soils for Vapour I
- #9 ASC NEPM (2013) HSL-D (Commercial/Industrial) 0 to <1m, Sand Soils for Vapour I
- #10 ASC NEPM (2013) HSL-D (Commercial/Industrial) +4 m, Sand Soils for Vapour Int
- #11 ASC NEPM (2013) Health Investigation Level (HIL-D) Commercial/Industrial





Table 4e. AEC - ME Soil Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	TRH											BTEX							Metals														
	TRH >C6-C9 Fraction	TRH >C10-C14 Fraction	TRH >C15-C28 Fraction	TRH >C29-C36 Fraction	TRH >C10-C36 Fraction	TRH >C6-C10 Fraction	TRH >C6-C10 less BTEX (F1)	TRH >C10-C16 Fraction	TRH >C10-C16 less Naphthalene (F2)	TRH >C16-C34 Fraction	TRH >C34-C40 Fraction	TRH >C10-C40 Fraction	Benzene	Toluene	Ethylbenzene	Xyrene (o)	Xyrene (m & p)	Xyrene Total	Total BTEX	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Selenium	Zinc	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	10	50	100	100	50	10	10	50	50	100	100	50	0.2	0.5	0.5	0.5	0.5	0.5	0.2	5	1	2	5	5	0.1	2	5	5	0.5	0.5	0.5	0.5	
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND							260 <sup>#9</sup>	NL <sup>#9</sup>					3 <sup>#9</sup>	NL <sup>#9</sup>	NL <sup>#9</sup>			230 <sup>#9</sup>															
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND							370 <sup>#8</sup>	NL <sup>#8</sup>					3 <sup>#8</sup>	NL <sup>#8</sup>	NL <sup>#8</sup>			NL <sup>#8</sup>															
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND							630 <sup>#7</sup>	NL <sup>#7</sup>					3 <sup>#7</sup>	NL <sup>#7</sup>	NL <sup>#7</sup>			NL <sup>#7</sup>															
Human Health - HSL-D - Vapour Intrusion + 4m SAND							NL <sup>#10</sup>	NL <sup>#10</sup>					3 <sup>#10</sup>	NL <sup>#10</sup>	NL <sup>#10</sup>			NL <sup>#10</sup>															
Human Health - Intrusive - Vapour Intrusion 0-<2m							NL <sup>#3</sup>	NL <sup>#3</sup>					77 <sup>#3</sup>	NL <sup>#3</sup>	NL <sup>#3</sup>			NL <sup>#3</sup>															
Human Health - Intrusive - Vapour Intrusion 2-<4m							NL <sup>#2</sup>	NL <sup>#2</sup>					160 <sup>#2</sup>	NL <sup>#2</sup>	NL <sup>#2</sup>			NL <sup>#2</sup>															
Human Health - Intrusive - Vapour Intrusion + 4m							NL <sup>#4</sup>	NL <sup>#4</sup>					NL <sup>#4</sup>	NL <sup>#4</sup>	NL <sup>#4</sup>			NL <sup>#4</sup>															
Human Health - Intrusive - Direct Contact							82000 <sup>#5</sup>	62000 <sup>#5</sup>	85000 <sup>#5</sup>	120000 <sup>#5</sup>			1100 <sup>#5</sup>	120000 <sup>#5</sup>	85000 <sup>#5</sup>			130000 <sup>#5</sup>															
Human Health - Direct Contact - HIL-D							26000 <sup>#6</sup>	20000 <sup>#6</sup>	27000 <sup>#6</sup>	38000 <sup>#6</sup>			430 <sup>#6</sup>	99000 <sup>#6</sup>	27000 <sup>#6</sup>			81000 <sup>#6</sup>			3000 <sup>#11</sup>	900 <sup>#11</sup>		240000 <sup>#11</sup>	1500 <sup>#11</sup>	730 <sup>#11</sup>	6000 <sup>#11</sup>	10000 <sup>#11</sup>	400000 <sup>#11</sup>				
NEPM (2013) EIL - Mt Piper Specific Commercial/Industrial (Aged)																				160 <sup>#1</sup>		870 <sup>#1</sup>	130 <sup>#1</sup>	1800 <sup>#1</sup>		160 <sup>#1</sup>							
NEPM (2013) ESL - Commercial & Industrial (Coarse)							215	170	1700	3300			75	135	165			180															
NEPM (2013) ESL - Commercial & Industrial (Fine)									2500	6600			95	135	185			95															

Location Code	Field ID	Sample Code	Sampled Date	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	15	<1	23	30	29	<0.1	40	<5	58	<0.5	<0.5	<0.5	<0.5
ME_MW01	ME-MW01-0.5	ES1324879002	14-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	9	<1	10	21	23	<0.1	11	<5	31	<0.5	<0.5	<0.5	<0.5
ME_MW02	ME-MW02-0.5	ES1325218003	14-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	6	<1	6	8	11	<0.1	20	<5	36	<0.5	<0.5	<0.5	<0.5
ME_MW03	ME-MW03-0.5	ES1324879006	14-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	6	<1	6	8	11	<0.1	20	<5	36	<0.5	<0.5	<0.5	<0.5
ME_MW04	ME-MW04-2.5	ES1325783002	21-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	21	<1	11	22	24	<0.1	44	<5	78	<0.5	<0.5	<0.5	<0.5
ME_MW04	ME-MW04-0.5	ES1324879004	14-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	10	<1	8	20	18	<0.1	44	<5	89	<0.5	<0.5	<0.5	0.6

Statistical Summary	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
Number of Results	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	5	5	0	5	0	5	0	0	0	1
Minimum Concentration	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	6	<1	6	8	11	<0.1	11	<5	31	<0.5	<0.5	<0.5	<0.5	
Maximum Concentration	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	21	<1	23	30	29	<0.1	44	<5	89	<0.5	<0.5	<0.5	0.6	
Average Concentration	5	25	50	50	25	5	5	25	25	50	50	25	0.1	0.25	0.25	0.25	0.25	0.25	0.1	12	0.5	12	20	21	0.05	32	2.5	58	0.25	0.25	0.25	0.32			
Median Concentration	5	25	50	50	25	5	5	25	25	50	50	25	0.1	0.25	0.25	0.25	0.25	0.25	0.1	10	0.5	10	21	23	0.05	40	2.5	58	0.25	0.25	0.25	0.25			
Standard Deviation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.9	0	6.7	7.9	6.8	0	15	0	25	0	0	0	0.16			
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

- Comments
- #1 NEPC (2010) Ecological Investigation Level Calculator
  - #2 CRC Care (2011) Intrusive Maintenance Workers, 2 to <4m, Sand Soils for Vapour Intrusion
  - #3 CRC Care (2011) Intrusive Maintenance Workers, 0 to <2m, Sand Soils for Vapour Intrusion
  - #4 CRC Care (2011) Intrusive Maintenance Workers, +4 m, Sand Soils for Vapour Intrusion
  - #5 CRC Care (2011) Intrusive Maintenance Workers for Direct Contact
  - #6 ASC NEPM (2013) HSL-D (Commercial/Industrial) for Direct Contact
  - #7 ASC NEPM (2013) HSL-D (Commercial/Industrial) 2 to <4m, Sand Soils for Vapour Intrusion
  - #8 ASC NEPM (2013) HSL-D (Commercial/Industrial) 1 to <2m, Sand Soils for Vapour Intrusion
  - #9 ASC NEPM (2013) HSL-D (Commercial/Industrial) 0 to <1m, Sand Soils for Vapour Intrusion
  - #10 ASC NEPM (2013) HSL-D (Commercial/Industrial) +4 m, Sand Soils for Vapour Intrusion
  - #11 ASC NEPM (2013) Health Investigation Level (HIL-D) Commercial/Industrial



Table 4e. AEC - ME Soil Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	PAH														Phenols													
	Benzo(a) pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Carcinogenic PAHs (as B(a)P TEQ (half LOB))	Carcinogenic PAHs (as B(a)P TEQ (LOB))	Naphthalene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	PAHs (Sum of total)	Carcinogenic PAHs (as BaP TEQ)	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,4-dimethylphenol	2,6-dichlorophenol	2-chlorophenol	2-methylphenol	2-nitrophenol	3,4,4-trimethylphenol	4-chloro-3-methylphenol	Pentachlorophenol	Phenol
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	2	0.5
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND							NL <sup>#9</sup>																					
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND							NL <sup>#8</sup>																					
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND							NL <sup>#7</sup>																					
Human Health - HSL-D - Vapour Intrusion + 4m SAND							NL <sup>#10</sup>																					
Human Health - Intrusive - Vapour Intrusion 0-<2m							NL <sup>#3</sup>																					
Human Health - Intrusive - Vapour Intrusion 2-<4m							NL <sup>#2</sup>																					
Human Health - Intrusive - Vapour Intrusion + 4m							NL <sup>#4</sup>																					
Human Health - Intrusive - Direct Contact							29000 <sup>#5</sup>																					
Human Health - Direct Contact - HIL-D							11000 <sup>#6</sup>								4000 <sup>#11</sup>	40 <sup>#11</sup>											660 <sup>#11</sup>	240000 <sup>#11</sup>
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)							370 <sup>#1</sup>																					
NEPM (2013) ESL - Commercial & Industrial (Coarse)	1.4																											
NEPM (2013) ESL - Commercial & Industrial (Fine)	1.4																											

Location Code	Field ID	Sample Code	Sampled Date	Benzo(a) pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Carcinogenic PAHs (as B(a)P TEQ (half LOB))	Carcinogenic PAHs (as B(a)P TEQ (LOB))	Naphthalene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	PAHs (Sum of total)	Carcinogenic PAHs (as BaP TEQ)	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,4-dimethylphenol	2,6-dichlorophenol	2-chlorophenol	2-methylphenol	2-nitrophenol	3,4,4-trimethylphenol	4-chloro-3-methylphenol	Pentachlorophenol	Phenol
ME_MW01	ME-MW01-0.5	ES1324879002	14-Nov-13	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<2	<0.5	
ME_MW02	ME_MW02_0.5	ES1325218003	14-Nov-13	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<2	<0.5	
ME_MW03	ME-MW03-0.5	ES1324879006	14-Nov-13	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<2	<0.5	
ME_MW04	ME_MW04_2.5	ES1325783002	21-Nov-13	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<2	<0.5	
ME_MW04	ME-MW04-0.5	ES1324879004	14-Nov-13	<0.5	0.6	<0.5	<0.5	0.7	1.2	<1 - 0.5	0.8	<0.5	1.6	<0.5	<0.5	2.1	1.2	7.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<2	<0.5

Statistical Summary	Benzo(a) pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Carcinogenic PAHs (as B(a)P TEQ (half LOB))	Carcinogenic PAHs (as B(a)P TEQ (LOB))	Naphthalene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	PAHs (Sum of total)	Carcinogenic PAHs (as BaP TEQ)	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,4-dimethylphenol	2,6-dichlorophenol	2-chlorophenol	2-methylphenol	2-nitrophenol	3,4,4-trimethylphenol	4-chloro-3-methylphenol	Pentachlorophenol	Phenol	
Number of Results	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
Number of Detects	0	1	0	0	5	5	1	1	0	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
Minimum Concentration	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<2	<0.5
Maximum Concentration	<0.5	0.6	<0.5	<0.5	0.7	1.2	0.5	0.8	<0.5	1.6	<0.5	<0.5	2.1	1.2	7.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<2	<0.5
Average Concentration	0.25	0.32	0.25	0.25	0.62	1.2	0.3	0.36	0.25	0.52	0.25	0.25	0.62	0.44	1.7	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.5	0.25	1	0.25
Median Concentration	0.25	0.25	0.25	0.25	0.6	1.2	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.5	0.25	1	0.25
Standard Deviation	0	0.16	0	0	0.045	0	0.11	0.25	0	0.6	0	0	0.83	0.42	3.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments

- #1 NEPC (2010) Ecological Investigation Level Calculator
- #2 CRC Care (2011) Intrusive Maintenance Workers, 2 to <4m, Sand Soils for Vapour Intr
- #3 CRC Care (2011) Intrusive Maintenance Workers, 0 to <2m, Sand Soils for Vapour Intr
- #4 CRC Care (2011) Intrusive Maintenance Workers, +4 m, Sand Soils for Vapour Intrusic
- #5 CRC Care (2011) Intrusive Maintenance Workers for Direct Contact
- #6 ASC NEPM (2013) HSL-D (Commercial/Industrial) for Direct Contact
- #7 ASC NEPM (2013) HSL-D (Commercial/Industrial) 2 to <4m, Sand Soils for Vapour Ir
- #8 ASC NEPM (2013) HSL-D (Commercial/Industrial) 1 to <2m, Sand Soils for Vapour Ir
- #9 ASC NEPM (2013) HSL-D (Commercial/Industrial) 0 to <1m, Sand Soils for Vapour Ir
- #10 ASC NEPM (2013) HSL-D (Commercial/Industrial) +4 m, Sand Soils for Vapour Intr
- #11 ASC NEPM (2013) Health Investigation Level (HIL-D) Commercial/Industrial



Table 4f. AEC - MF Soil Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	TRH										BTEX							Metals																
	TRH >C6-C9 Fraction	TRH >C10-C14 Fraction	TRH >C15-C28 Fraction	TRH >C29-C36 Fraction	TRH >C10-C36 Fraction	TRH >C6-C10 Fraction	TRH >C6-C10 less BTEX (FI)	TRH >C10-C16 Fraction	TRH >C16-C34 Fraction	TRH >C34-C40 Fraction	TRH >C10-C40 Fraction	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Total BTEX	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Selenium	Zinc	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene		
EQL	10	50	100	100	50	10	10	50	100	100	50	0.2	0.5	0.5	0.5	0.5	0.5	0.2	5	1	2	5	5	0.1	2	5	5	0.5	0.5	0.5	0.5	0.5		
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND							260 <sup>#9</sup>					3 <sup>#9</sup>	NL <sup>#9</sup>	NL <sup>#9</sup>			230 <sup>#9</sup>																	
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND							370 <sup>#8</sup>					3 <sup>#8</sup>	NL <sup>#8</sup>	NL <sup>#8</sup>			NL <sup>#8</sup>																	
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND							630 <sup>#7</sup>					3 <sup>#7</sup>	NL <sup>#7</sup>	NL <sup>#7</sup>			NL <sup>#7</sup>																	
Human Health - HSL-D - Vapour Intrusion + 4m SAND							NL <sup>#10</sup>					3 <sup>#10</sup>	NL <sup>#10</sup>	NL <sup>#10</sup>			NL <sup>#10</sup>																	
Human Health - Intrusive - Vapour Intrusion 0-<2m							NL <sup>#3</sup>					77 <sup>#3</sup>	NL <sup>#3</sup>	NL <sup>#3</sup>			NL <sup>#3</sup>																	
Human Health - Intrusive - Vapour Intrusion 2-<4m							NL <sup>#2</sup>					160 <sup>#2</sup>	NL <sup>#2</sup>	NL <sup>#2</sup>			NL <sup>#2</sup>																	
Human Health - Intrusive - Vapour Intrusion + 4m							NL <sup>#4</sup>					NL <sup>#4</sup>	NL <sup>#4</sup>	NL <sup>#4</sup>			NL <sup>#4</sup>																	
Human Health - Intrusive - Direct Contact							82000 <sup>#5</sup>		85000 <sup>#5</sup>	120000 <sup>#5</sup>		1100 <sup>#5</sup>	120000 <sup>#5</sup>	85000 <sup>#5</sup>			130000 <sup>#5</sup>																	
Human Health - Direct Contact - HIL-D							26000 <sup>#6</sup>		27000 <sup>#6</sup>	38000 <sup>#6</sup>		430 <sup>#6</sup>	99000 <sup>#6</sup>	27000 <sup>#6</sup>			81000 <sup>#6</sup>		3000 <sup>#11</sup>	900 <sup>#11</sup>		240000 <sup>#11</sup>	1500 <sup>#11</sup>	730 <sup>#11</sup>	6000 <sup>#11</sup>	10000 <sup>#11</sup>	400000 <sup>#11</sup>							
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)																			160 <sup>#1</sup>		870 <sup>#1</sup>	130 <sup>#1</sup>	1800 <sup>#1</sup>			160 <sup>#1</sup>								
NEPM (2013) ESL - Commercial & Industrial (Coarse)							215		1700	3300		75	135	165			180																1.4	
NEPM (2013) ESL - Commercial & Industrial (Fine)									2500	6600		95	135	185			95																	1.4

Location Code	Field ID	Sample Code	Sampled Date	<10	<50	<100	<100	<50	<10	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	22	<1	6	18	22	<0.1	104	<5	118	<0.5	<0.5	<0.5	<0.5	<0.5
MF_MW01	MF_MW01_0.2	ES1323859009	30-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	19	<1	8	23	22	<0.1	66	<5	125	<0.5	<0.5	<0.5	<0.5	<0.5
MF_MW02	MF_MW02_0.1	ES1323859008	30-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	9	<1	5	15	19	<0.1	56	<5	138	<0.5	<0.5	<0.5	<0.5	<0.5
MF_MW03	MF_MW03_0.2	ES1323859007	30-Oct-13	<10	<50	160	<100	160	<10	<10	<50	170	<100	170	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	13	<1	8	16	20	<0.1	60	<5	76	<0.5	<0.5	<0.5	<0.5	<0.5
MF_MW04	MF_MW04_0.2	ES1323859010	30-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	11	<1	9	16	18	<0.1	59	<5	103	<0.5	<0.5	<0.5	<0.5	<0.5
MF_MW05	MF_MW05_0.2	ES1323859012	30-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	11	<1	9	16	18	<0.1	59	<5	103	<0.5	<0.5	<0.5	<0.5	<0.5

Statistical Summary

Number of Results	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Number of Detects	0	0	1	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	5	0	5	5	5	0	5	0	5	0	0	0	0	0
Minimum Concentration	<10	<50	<100	<100	<50	<10	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	9	<1	5	15	18	<0.1	56	<5	76	<0.5	<0.5	<0.5	<0.5	<0.5	
Maximum Concentration	<10	<50	160	<100	160	<10	<10	<50	170	<100	170	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	22	<1	9	23	22	<0.1	104	<5	138	<0.5	<0.5	<0.5	<0.5	<0.5	
Average Concentration	5	25	72	50	52	5	5	25	74	50	54	0.1	0.25	0.25	0.25	0.25	0.1	15	0.5	7.2	18	20	0.05	69	2.5	112	0.25	0.25	0.25	0.25	0.25	
Median Concentration	5	25	50	50	25	5	5	25	50	50	25	0.1	0.25	0.25	0.25	0.25	0.1	13	0.5	8	16	20	0.05	60	2.5	118	0.25	0.25	0.25	0.25	0.25	
Standard Deviation	0	0	49	0	60	0	0	0	54	0	65	0	0	0	0	0	0	5.5	0	1.6	3.2	1.8	0	20	0	24	0	0	0	0	0	
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Number of Guideline Exceedances (Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Comments

- #1 NEPC (2010) Ecological Investigation Level Calculator
- #2 CRC Care (2011) Intrusive Maintenance Workers, 2 to <4m, Sand Soils for Vapour Intrusion
- #3 CRC Care (2011) Intrusive Maintenance Workers, 0 to <2m, Sand Soils for Vapour Intrusion
- #4 CRC Care (2011) Intrusive Maintenance Workers, +4 m, Sand Soils for Vapour Intrusion
- #5 CRC Care (2011) Intrusive Maintenance Workers for Direct Contact
- #6 ASC NEPM (2013) HSL-D (Commercial/Industrial) for Direct Contact
- #7 ASC NEPM (2013) HSL-D (Commercial/Industrial) 2 to <4m, Sand Soils for Vapour Intrusion
- #8 ASC NEPM (2013) HSL-D (Commercial/Industrial) 1 to <2m, Sand Soils for Vapour Intrusion
- #9 ASC NEPM (2013) HSL-D (Commercial/Industrial) 0 to <1m, Sand Soils for Vapour Intrusion
- #10 ASC NEPM (2013) HSL-D (Commercial/Industrial) +4 m, Sand Soils for Vapour Intrusion
- #11 ASC NEPM (2013) Health Investigation Level (HIL-D) Commercial/Industrial





Table 4f. AEC - MF Soil Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	PAH												Phenols												
	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Naphthalene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	PAHs (Sum of total)	Carcinogenic PAHs (as BaP TEQ)	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,4-dimethylphenol	2,6-dichlorophenol	2-chlorophenol	2-methylphenol	2-nitrophenol	3-&4-methylphenol	4-chloro-3-methylphenol	Pentachlorophenol	Phenol
EQI	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND				NL <sup>#9</sup>																					
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND				NL <sup>#8</sup>																					
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND				NL <sup>#7</sup>																					
Human Health - HSL-D - Vapour Intrusion + 4m SAND				NL <sup>#10</sup>																					
Human Health - Intrusive - Vapour Intrusion 0-<2m				NL <sup>#3</sup>																					
Human Health - Intrusive - Vapour Intrusion 2-<4m				NL <sup>#2</sup>																					
Human Health - Intrusive - Vapour Intrusion + 4m				NL <sup>#4</sup>																					
Human Health - Intrusive - Direct Contact				29000 <sup>#5</sup>																					
Human Health - Direct Contact - HIL-D				11000 <sup>#6</sup>							4000 <sup>#11</sup>	40 <sup>#11</sup>											660 <sup>#11</sup>	240000 <sup>#11</sup>	
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)				370 <sup>#1</sup>																					
NEPM (2013) ESL - Commercial & Industrial (Coarse)																									
NEPM (2013) ESL - Commercial & Industrial (Fine)																									

Location Code	Field ID	Sample Code	Sampled Date	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Naphthalene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	PAHs (Sum of total)	Carcinogenic PAHs (as BaP TEQ)	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,4-dimethylphenol	2,6-dichlorophenol	2-chlorophenol	2-methylphenol	2-nitrophenol	3-&4-methylphenol	4-chloro-3-methylphenol	Pentachlorophenol	Phenol
MF_MW01	MF_MW01_0.2	ES1323859009	30-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MF_MW02	MF_MW02_0.1	ES1323859008	30-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MF_MW03	MF_MW03_0.2	ES1323859007	30-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	1	<0.5	1.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MF_MW04	MF_MW04_0.2	ES1323859010	30-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MF_MW05	MF_MW05_0.2	ES1323859012	30-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Statistical Summary

Number of Results	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Number of Detects	0	0	0	0	0	0	1	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Maximum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	1	<0.5	1.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Average Concentration	0.25	0.25	0.25	0.25	0.25	0.25	0.32	0.25	0.25	0.49	0.25	0.61	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Median Concentration	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Standard Deviation	0	0	0	0	0	0	0.16	0	0	0.35	0	0.59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments

- #1 NEPC (2010) Ecological Investigation Level Calculator
- #2 CRC Care (2011) Intrusive Maintenance Workers, 2 to <4m, Sand Soils for Vapour Intr
- #3 CRC Care (2011) Intrusive Maintenance Workers, 0 to <2m, Sand Soils for Vapour Intr
- #4 CRC Care (2011) Intrusive Maintenance Workers, +4 m, Sand Soils for Vapour Intrusio
- #5 CRC Care (2011) Intrusive Maintenance Workers for Direct Contact
- #6 ASC NEPM (2013) HSL-D (Commercial/Industrial) for Direct Contact
- #7 ASC NEPM (2013) HSL-D (Commercial/Industrial) 2 to <4m, Sand Soils for Vapour Ir
- #8 ASC NEPM (2013) HSL-D (Commercial/Industrial) 1 to <2m, Sand Soils for Vapour Ir
- #9 ASC NEPM (2013) HSL-D (Commercial/Industrial) 0 to <1m, Sand Soils for Vapour Ir
- #10 ASC NEPM (2013) HSL-D (Commercial/Industrial) +4 m, Sand Soils for Vapour Intr
- #11 ASC NEPM (2013) Health Investigation Level (HIL-D) Commercial/Industrial



Table 4g. AEC - MG Soil Chemistry Summary  
 Mt Piper Power Station - Stage 2 ESA  
 Project Symphony - 0207423

	Metals								
	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Selenium	Zinc
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	5	1	2	5	5	0.1	2	5	5
Human Health - Direct Contact - HIL-D	3000 <sup>#2</sup>	900 <sup>#2</sup>		240000 <sup>#2</sup>	1500 <sup>#2</sup>	730 <sup>#2</sup>	6000 <sup>#2</sup>	10000 <sup>#2</sup>	400000 <sup>#2</sup>
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)	160 <sup>#1</sup>		870 <sup>#1</sup>	130 <sup>#1</sup>	1800 <sup>#1</sup>		160 <sup>#1</sup>		280 <sup>#1</sup>

LocCode	Field_ID	SampleCode	Sampled Date	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Selenium	Zinc
MG_SB02	MG_SB02_0.1	ES1402022002	13/11/2013	15	<1	24	12	24	<0.1	35	<5	66
MG_SB03	MG_SB03_0.2	ES1402022001	13/11/2013	6	<1	8	20	25	<0.1	23	<5	52

**Statistical Summary**

Number of Results	2	2	2	2	2	2	2	2	2	2
Number of Detects	2	0	2	2	2	0	2	0	2	2
Minimum Concentration	6	<1	8	12	24	<0.1	23	<5	52	
Maximum Concentration	15	<1	24	20	25	<0.1	35	<5	66	
Median Concentration	10.5	0.5	16	16	24.5	0.05	29	2.5	59	
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0

#1 NEPC (2010) Ecological Investigation Level Calculator

#2 ASC NEPM (2013) Health Investigation Level (HIL-D) Commercial/Industrial



Table 4h. AEC - MH Soil Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	TRH												BTEX							Metals													
	TRH >C6-C9 Fraction	TRH >C10-C14 Fraction	TRH >C15-C28 Fraction	TRH >C29-C36 Fraction	TRH >C10-C36 Fraction	TRH >C6-C10 Fraction	TRH >C6-C10 less BTEX (Fl)	TRH >C10-C16 Fraction	TRH >C10-C16 less Naphthalene (F2)	TRH >C16-C34 Fraction	TRH >C34-C40 Fraction	TRH >C10-C40 Fraction	Benzene	Toluene	Ethylbenzene	Xyrene (o)	Xyrene (m & p)	Xyrene Total	Total BTEX	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Selenium	Zinc	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
EQL	10	50	100	100	50	10	10	50	50	100	100	50	0.2	0.5	0.5	0.5	0.5	0.5	0.2	5	1	2	5	5	0.1	2	5	5	0.5	0.5	0.5	0.5	
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND							260 <sup>#9</sup>	NL <sup>#9</sup>					3 <sup>#9</sup>	NL <sup>#9</sup>	NL <sup>#9</sup>			230 <sup>#9</sup>															
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND							370 <sup>#8</sup>	NL <sup>#8</sup>					3 <sup>#8</sup>	NL <sup>#8</sup>	NL <sup>#8</sup>			NL <sup>#8</sup>															
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND							630 <sup>#7</sup>	NL <sup>#7</sup>					3 <sup>#7</sup>	NL <sup>#7</sup>	NL <sup>#7</sup>			NL <sup>#7</sup>															
Human Health - HSL-D - Vapour Intrusion + 4m SAND							NL <sup>#10</sup>	NL <sup>#10</sup>					3 <sup>#10</sup>	NL <sup>#10</sup>	NL <sup>#10</sup>			NL <sup>#10</sup>															
Human Health - Intrusive - Vapour Intrusion 0-<2m							NL <sup>#3</sup>	NL <sup>#3</sup>					77 <sup>#3</sup>	NL <sup>#3</sup>	NL <sup>#3</sup>			NL <sup>#3</sup>															
Human Health - Intrusive - Vapour Intrusion 2-<4m							NL <sup>#2</sup>	NL <sup>#2</sup>					160 <sup>#2</sup>	NL <sup>#2</sup>	NL <sup>#2</sup>			NL <sup>#2</sup>															
Human Health - Intrusive - Vapour Intrusion + 4m							NL <sup>#4</sup>	NL <sup>#4</sup>					NL <sup>#4</sup>	NL <sup>#4</sup>	NL <sup>#4</sup>			NL <sup>#4</sup>															
Human Health - Intrusive - Direct Contact							82000 <sup>#5</sup>	62000 <sup>#5</sup>	85000 <sup>#5</sup>	120000 <sup>#5</sup>			1100 <sup>#5</sup>	120000 <sup>#5</sup>	85000 <sup>#5</sup>			130000 <sup>#5</sup>															
Human Health - Direct Contact - HIL-D							26000 <sup>#6</sup>	20000 <sup>#6</sup>	27000 <sup>#6</sup>	38000 <sup>#6</sup>			430 <sup>#6</sup>	99000 <sup>#6</sup>	27000 <sup>#6</sup>			81000 <sup>#6</sup>			3000 <sup>#11</sup>	900 <sup>#11</sup>		240000 <sup>#11</sup>	1500 <sup>#11</sup>	730 <sup>#11</sup>	6000 <sup>#11</sup>	10000 <sup>#11</sup>	40000 <sup>#11</sup>				
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)																				160 <sup>#1</sup>		870 <sup>#1</sup>	130 <sup>#1</sup>	1800 <sup>#1</sup>		160 <sup>#1</sup>							
NEPM (2013) ESL - Commercial & Industrial (Coarse)							215		170	1700	3300		75	135	165			180															
NEPM (2013) ESL - Commercial & Industrial (Fine)											2500	6600		95	135	185			95														

Location Code	Field ID	Sample Code	Sampled Date	<10	80	540	290	910	11	11	130	130	720	150	1000	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	2	13	17	<0.1	2	<5	70	<0.5	<0.5	<0.5	1
MH_SS02	MH_GRAB_01	ES1324880007	13-Nov-13	<10	80	540	290	910	11	11	130	130	720	150	1000	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	2	13	17	<0.1	2	<5	70	<0.5	<0.5	<0.5	1
MH_MW01	MH_MW01_0.2	ES1324880005	13-Nov-13	<10	<50	200	<100	200	<10	<10	<50	<50	240	<100	240	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	18	<1	<2	14	24	0.1	<2	<5	55	<0.5	<0.5	<0.5	<0.5
MH_MW01	MH_MW01_26.0	ES1325219006	18-Nov-13	<10	<50	120	<100	120	<10	<10	<50	<50	150	<100	150	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	110	10	14	<0.1	11	<5	48	<0.5	<0.5	<0.5	<0.5
MH_MW01	MH_MW01_8.0	ES1325219005	18-Nov-13	<10	60	450	220	730	<10	<10	100	100	560	<100	780	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	5	13	15	<0.1	5	<5	30	<0.5	<0.5	<0.5	0.7
MH_MW02	MH_MW02_0.2	ES1324880003	13-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	10	<1	36	<5	20	<0.1	6	<5	47	<0.5	<0.5	<0.5	<0.5
MH_MW02	MH_MW02_12.0	ES1325472002	19-Nov-13	<10	<50	320	100	420	<10	<10	70	70	360	<100	430	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	5	<1	28	13	19	<0.1	17	<5	46	<0.5	<0.5	<0.5	0.8
MH_MW03	MH_MW03_1.0	ES1324880002	13-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	12	<1	10	16	22	<0.1	37	<5	89	<0.5	<0.5	<0.5	<0.5
MH_MW03	MH_MW03_18.0	ES1325219001	14-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	14	2	81	23	22	<0.1	51	<5	76	<0.5	<0.5	<0.5	<0.5
MH_SB04	MH_SB04_0.1	ES1324880008	13-Nov-13	<10	<50	190	<100	190	<10	<10	<50	<50	220	<100	220	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	7	<1	3	12	19	<0.1	7	<5	70	<0.5	<0.5	<0.5	<0.5

Statistical Summary																																					
Number of Results	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9		
Number of Detects	0	2	6	3	6	1	1	3	3	6	2	6	0	0	0	0	0	0	0	0	0	6	1	8	8	9	1	8	0	9	0	0	0	3			
Minimum Concentration	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	<2	<5	14	<0.1	<2	<5	30	<0.5	<0.5	<0.5	<0.5			
Maximum Concentration	<10	80	540	290	910	11	11	130	130	720	150	1000	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	18	2	110	23	24	0.1	51	<5	89	<0.5	<0.5	<0.5	1			
Average Concentration	5	35	219	101	294	5.7	5.7	50	50	267	69	322	0.1	0.25	0.25	0.25	0.25	0.25	0.1	8.2	0.67	31	13	19	0.056	15	2.5	59	0.25	0.25	0.25	0.25	0.44				
Median Concentration	5	25	190	50	190	5	5	25	25	220	50	220	0.1	0.25	0.25	0.25	0.25	0.25	0.1	7	0.5	10	13	19	0.05	7	2.5	55	0.25	0.25	0.25	0.25					
Standard Deviation	0	20	181	90	326	2	2	40	40	239	38	352	0	0	0	0	0	0	0	5.7	0.5	39	5.4	3.3	0.017	17	0	18	0	0	0	0	0.3				
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			

- Comments
- #1 NEPC (2010) Ecological Investigation Level Calculator
  - #2 CRC Care (2011) Intrusive Maintenance Workers, 2 to <4m, Sand Soils for Vapour Intrusion
  - #3 CRC Care (2011) Intrusive Maintenance Workers, 0 to <2m, Sand Soils for Vapour Intrusion
  - #4 CRC Care (2011) Intrusive Maintenance Workers, +4 m, Sand Soils for Vapour Intrusion
  - #5 CRC Care (2011) Intrusive Maintenance Workers for Direct Contact
  - #6 ASC NEPM (2013) HSL-D (Commercial/Industrial) for Direct Contact
  - #7 ASC NEPM (2013) HSL-D (Commercial/Industrial) 2 to <4m, Sand Soils for Vapour Intrusion
  - #8 ASC NEPM (2013) HSL-D (Commercial/Industrial) 1 to <2m, Sand Soils for Vapour Intrusion
  - #9 ASC NEPM (2013) HSL-D (Commercial/Industrial) 0 to <1m, Sand Soils for Vapour Intrusion
  - #10 ASC NEPM (2013) HSL-D (Commercial/Industrial) +4 m, Sand Soils for Vapour Intrusion
  - #11 ASC NEPM (2013) Health Investigation Level (HIL-D) Commercial/Industrial





Table 4h. AEC - MH Soil Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	PAH														Phenols														
	Benzo(a) pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Carcinogenic PAHs (as B(a)P TEQ (half LOB))	Carcinogenic PAHs (as B(a)P TEQ (LOB))	Naphthalene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	PAHs (Sum of total)	Carcinogenic PAHs (as BaP TEQ)	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,4-dimethylphenol	2,6-dichlorophenol	2-chlorophenol	2-methylphenol	2-nitrophenol	3-&4-methylphenol	4-chloro-3-methylphenol	Pentachlorophenol	Phenol	
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	2	0.5	
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND							NL <sup>#9</sup>																						
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND							NL <sup>#8</sup>																						
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND							NL <sup>#7</sup>																						
Human Health - HSL-D - Vapour Intrusion + 4m SAND							NL <sup>#10</sup>																						
Human Health - Intrusive - Vapour Intrusion 0-<2m							NL <sup>#3</sup>																						
Human Health - Intrusive - Vapour Intrusion 2-<4m							NL <sup>#2</sup>																						
Human Health - Intrusive - Vapour Intrusion + 4m							NL <sup>#4</sup>																						
Human Health - Intrusive - Direct Contact							29000 <sup>#5</sup>																						
Human Health - Direct Contact - HIL-D							11000 <sup>#6</sup>								4000 <sup>#11</sup>	40 <sup>#11</sup>											660 <sup>#11</sup>	24000 <sup>#11</sup>	
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)							370 <sup>#1</sup>																						
NEPM (2013) ESL - Commercial & Industrial (Coarse)	1.4																												
NEPM (2013) ESL - Commercial & Industrial (Fine)	1.4																												

Location Code	Field ID	Sample Code	Sampled Date	<0.5	0.9	<0.5	<0.5	0.8	1.3	<0.5	1.5	<0.5	1.6	0.5	<0.5	3.6	1.3	10.4	<0.5	-	-	-	-	-	-	-	-	-	-	-
MH_SS02	MH_GRAB_01	ES1324880007	13-Nov-13	<0.5	0.9	<0.5	<0.5	0.8	1.3	<0.5	1.5	<0.5	1.6	0.5	<0.5	3.6	1.3	10.4	<0.5	-	-	-	-	-	-	-	-	-	-	-
MH_MW01	MH_MW01_0.2	ES1324880005	13-Nov-13	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.7	<0.5	1.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MH_MW01	MH_MW01_26.0	ES1325219006	18-Nov-13	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MH_MW01	MH_MW01_8.0	ES1325219005	18-Nov-13	<0.5	0.6	<0.5	<0.5	0.7	1.2	<0.5	1	<0.5	1.3	<0.5	<0.5	2.3	1.1	7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MH_MW02	MH_MW02_0.2	ES1324880003	13-Nov-13	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MH_MW02	MH_MW02_12.0	ES1325472002	19-Nov-13	0.6	0.7	<0.5	<0.5	1.1	1.4	<0.5	1.1	<0.5	1.6	<0.5	<0.5	2	1.4	8.2	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MH_MW03	MH_MW03_1.0	ES1324880002	13-Nov-13	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MH_MW03	MH_MW03_18.0	ES1325219001	14-Nov-13	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<1 - 0.7	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	<0.5	1.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MH_SB04	MH_SB04_0.1	ES1324880008	13-Nov-13	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1	<0.5	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Statistical Summary																															
Number of Results	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8
Number of Detects	1	3	0	0	9	9	1	3	0	3	1	0	7	3	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Maximum Concentration	0.6	0.9	<0.5	<0.5	1.1	1.4	0.7	1.5	<0.5	1.6	0.5	<0.5	3.6	1.4	10.4	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Average Concentration	0.29	0.41	0.25	0.25	0.69	1.2	0.29	0.57	0.25	0.67	0.28	0.25	1.4	0.59	3.4	0.31	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	
Median Concentration	0.25	0.25	0.25	0.25	0.6	1.2	0.25	0.25	0.25	0.25	0.25	0.25	1	0.25	1.5	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	
Standard Deviation	0.12	0.25	0	0	0.17	0.071	0.12	0.49	0	0.63	0.083	0	1.1	0.51	3.9	0.18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Number of Guideline Exceedances (Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Comments  
 #1 NEPC (2010) Ecological Investigation Level Calculator  
 #2 CRC Care (2011) Intrusive Maintenance Workers, 2 to <4m, Sand Soils for Vapour Intr  
 #3 CRC Care (2011) Intrusive Maintenance Workers, 0 to <2m, Sand Soils for Vapour Intr  
 #4 CRC Care (2011) Intrusive Maintenance Workers, +4 m, Sand Soils for Vapour Intrusi  
 #5 CRC Care (2011) Intrusive Maintenance Workers for Direct Contact  
 #6 ASC NEPM (2013) HSL-D (Commercial/Industrial) for Direct Contact  
 #7 ASC NEPM (2013) HSL-D (Commercial/Industrial) 2 to <4m, Sand Soils for Vapour Ir  
 #8 ASC NEPM (2013) HSL-D (Commercial/Industrial) 1 to <2m, Sand Soils for Vapour Ir  
 #9 ASC NEPM (2013) HSL-D (Commercial/Industrial) 0 to <1m, Sand Soils for Vapour Ir  
 #10 ASC NEPM (2013) HSL-D (Commercial/Industrial) +4 m, Sand Soils for Vapour Intr  
 #11 ASC NEPM (2013) Health Investigation Level (HIL-D) Commercial/Industrial



Table 4i. AEC - MI Soil Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	TRH											BTEX							Metals											
	TRH > C6-C9 Fraction	TRH > C10-C14 Fraction	TRH > C15-C28 Fraction	TRH > C29-C36 Fraction	TRH > C10-C36 Fraction	TRH > C6-C10 Fraction	TRH > C6-C10 less BTEX (F1)	TRH > C10-C16 Fraction	TRH > C10-C16 less Naphthalene (F2)	TRH > C16-C34 Fraction	TRH > C34-C40 Fraction	TRH > C10-C40 Fraction	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Total BTEX	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Selenium	Zinc	Acenaphthene	Acenaphthylene
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	10	50	100	100	50	10	10	50	100	100	50	0.2	0.5	0.5	0.5	0.5	0.5	0.2	5	1	2	5	5	0.1	2	5	5	0.5	0.5	
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND							260 <sup>#9</sup>	NL <sup>#9</sup>				3 <sup>#9</sup>	NL <sup>#9</sup>	NL <sup>#9</sup>			230 <sup>#9</sup>													
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND							370 <sup>#8</sup>	NL <sup>#8</sup>				3 <sup>#8</sup>	NL <sup>#8</sup>	NL <sup>#8</sup>			NL <sup>#8</sup>													
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND							630 <sup>#7</sup>	NL <sup>#7</sup>				3 <sup>#7</sup>	NL <sup>#7</sup>	NL <sup>#7</sup>			NL <sup>#7</sup>													
Human Health - HSL-D - Vapour Intrusion + 4m SAND							NL <sup>#10</sup>	NL <sup>#10</sup>				3 <sup>#10</sup>	NL <sup>#10</sup>	NL <sup>#10</sup>			NL <sup>#10</sup>													
Human Health - Intrusive - Vapour Intrusion 0-<2m							NL <sup>#3</sup>	NL <sup>#3</sup>				77 <sup>#3</sup>	NL <sup>#3</sup>	NL <sup>#3</sup>			NL <sup>#3</sup>													
Human Health - Intrusive - Vapour Intrusion 2-<4m							NL <sup>#2</sup>	NL <sup>#2</sup>				160 <sup>#2</sup>	NL <sup>#2</sup>	NL <sup>#2</sup>			NL <sup>#2</sup>													
Human Health - Intrusive - Vapour Intrusion + 4m							NL <sup>#4</sup>	NL <sup>#4</sup>				NL <sup>#4</sup>	NL <sup>#4</sup>	NL <sup>#4</sup>			NL <sup>#4</sup>													
Human Health - Intrusive - Direct Contact							82000 <sup>#5</sup>	62000 <sup>#5</sup>	85000 <sup>#5</sup>	120000 <sup>#5</sup>		1100 <sup>#5</sup>	120000 <sup>#5</sup>	85000 <sup>#5</sup>			130000 <sup>#5</sup>													
Human Health - Direct Contact - HIL-D							26000 <sup>#6</sup>	20000 <sup>#6</sup>	27000 <sup>#6</sup>	38000 <sup>#6</sup>		430 <sup>#6</sup>	99000 <sup>#6</sup>	27000 <sup>#6</sup>			81000 <sup>#6</sup>			3000 <sup>#11</sup>	900 <sup>#11</sup>		240000 <sup>#11</sup>	1500 <sup>#11</sup>	730 <sup>#11</sup>	6000 <sup>#11</sup>	10000 <sup>#11</sup>	400000 <sup>#11</sup>		
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)																				160 <sup>#1</sup>		870 <sup>#1</sup>	130 <sup>#1</sup>	1800 <sup>#1</sup>		160 <sup>#1</sup>		280 <sup>#1</sup>		
NEPM (2013) ESL - Commercial & Industrial (Coarse)							215		170	1700	3300		75	135	165		180													
NEPM (2013) ESL - Commercial & Industrial (Fine)										2500	6600		95	135	185		95													

Location Code	Field ID	Sample Code	Sampled Date	<10	<50	<100	<100	<50	<10	<10	<50	-	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	40	<1	12	18	34	0.1	30	<5	36	<0.5	<0.5
MI_SB02	MI_SB02_0.2	ES1323859018	30-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	16	<1	15	30	24	<0.1	73	<5	90	<0.5	<0.5	
MI_SB03	MI_SB03_0.2	ES1323858012	01-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	35	<1	15	12	23	<0.1	18	<5	47	<0.5	<0.5	
MI_SB03	MI_SB03_2.8	ES1325783004	21-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	16	<1	2	12	32	0.2	5	<5	13	<0.5	<0.5	
MI_SB04	MI_SB04_0.2	ES1322146008	09-Oct-13	<10	50	380	100	530	<10	<10	100	100	410	<100	510	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	11	<1	4	15	34	<0.1	7	<5	29	-	-	
MI_SB04	MI_SB04_2.1	ES1326939001	21-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	<1	4	15	34	<0.1	7	<5	29	-	-	
MI_SB05	MI_SB05_0.2	ES1323859016	30-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	16	<1	8	14	16	<0.1	9	<5	20	<0.5	<0.5	
MI_SB06	MI_SB06_0.2	ES1323858014	01-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	14	<1	14	19	18	<0.1	42	<5	78	<0.5	<0.5	
MI_SB06	MI_SB06_1.4	ES1325783005	21-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	21	<1	9	15	30	<0.1	74	<5	128	<0.5	<0.5	
MI_SB07	MI_SB07_0.2	ES1322146001	08-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	21	<1	13	19	18	<0.1	15	<5	31	<0.5	<0.5	

Statistical Summary																																				
Number of Results	8	8	8	8	8	8	8	8	8	6	8	8	8	8	8	8	8	8	8	8	8	9	9	9	9	9	9	9	9	9	9	9	8	8		
Number of Detects	0	1	1	1	1	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	9	0	9	9	9	9	2	9	0	9	0	0	0		
Minimum Concentration	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	11	<1	2	12	16	<0.1	5	<5	13	<0.5	<0.5				
Maximum Concentration	<10	50	380	100	530	<10	<10	100	100	410	<100	510	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	40	<1	15	30	34	0.2	74	<5	128	<0.5	<0.5				
Average Concentration	5	28	91	56	88	5	5	34	38	95	50	86	0.1	0.25	0.25	0.25	0.25	0.25	0.25	0.1	21	0.5	10	17	25	0.072	30	2.5	52	0.25	0.25					
Median Concentration	5	25	50	50	25	5	5	25	25	50	50	25	0.1	0.25	0.25	0.25	0.25	0.25	0.1	16	0.5	12	15	24	0.05	18	2.5	36	0.25	0.25						
Standard Deviation	0	8.8	117	18	179	0	0	27	31	127	0	171	0	0	0	0	0	0	0	9.9	0	4.8	5.5	7.2	0.051	27	0	38	0	0						
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Number of Guideline Exceedances (Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

- Comments**
- #1 NEPC (2010) Ecological Investigation Level Calculator
  - #2 CRC Care (2011) Intrusive Maintenance Workers, 2 to <4m, Sand Soils for Vapour Intrusion
  - #3 CRC Care (2011) Intrusive Maintenance Workers, 0 to <2m, Sand Soils for Vapour Intrusion
  - #4 CRC Care (2011) Intrusive Maintenance Workers, +4 m, Sand Soils for Vapour Intrusion
  - #5 CRC Care (2011) Intrusive Maintenance Workers for Direct Contact
  - #6 ASC NEPM (2013) HSL-D (Commercial/Industrial) for Direct Contact
  - #7 ASC NEPM (2013) HSL-D (Commercial/Industrial) 2 to <4m, Sand Soils for Vapour Intrusion
  - #8 ASC NEPM (2013) HSL-D (Commercial/Industrial) 1 to <2m, Sand Soils for Vapour Intrusion
  - #9 ASC NEPM (2013) HSL-D (Commercial/Industrial) 0 to <1m, Sand Soils for Vapour Intrusion
  - #10 ASC NEPM (2013) HSL-D (Commercial/Industrial) +4 m, Sand Soils for Vapour Intrusion
  - #11 ASC NEPM (2013) Health Investigation Level (HIL-D) Commercial/Industrial



	Chlorinated Hydrocarbons																										VOCs				
	1,1,2-trichloroethane	1,1-dichloroethane	1,1-dichloroethene	1,1-dichloropropene	1,2,3-trichloropropane	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	1,2-dichloropropane	Bromodichloromethane	Bromoform	Carbon tetrachloride	Chlorodibromomethane	Chloroethane	Chloroform	Chloromethane	cis-1,2-dichloroethene	dis-1,3-dichloropropene	Dibromomethane	Hexachlorobutadiene	Trichloroethene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Vinyl chloride	cis-1,4-Dichloro-2-butene	Pentachloroethane	trans-1,4-Dichloro-2-butene	1,2,4-trimethylbenzene	
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	0.5	5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	0.5	0.5	0.5	0.5	
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND																															
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND																															
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND																															
Human Health - HSL-D - Vapour Intrusion + 4m SAND																															
Human Health - Intrusive - Vapour Intrusion 0-<2m																															
Human Health - Intrusive - Vapour Intrusion 2-<4m																															
Human Health - Intrusive - Vapour Intrusion + 4m																															
Human Health - Intrusive - Direct Contact																															
Human Health - Direct Contact - HIL-D																															
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)																															
NEPM (2013) ESL - Commercial & Industrial (Coarse)																															
NEPM (2013) ESL - Commercial & Industrial (Fine)																															

Location Code	Field ID	Sample Code	Sampled Date	1,1,2-trichloroethane	1,1-dichloroethane	1,1-dichloroethene	1,1-dichloropropene	1,2,3-trichloropropane	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	1,2-dichloropropane	Bromodichloromethane	Bromoform	Carbon tetrachloride	Chlorodibromomethane	Chloroethane	Chloroform	Chloromethane	cis-1,2-dichloroethene	dis-1,3-dichloropropene	Dibromomethane	Hexachlorobutadiene	Trichloroethene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Vinyl chloride	cis-1,4-Dichloro-2-butene	Pentachloroethane	trans-1,4-Dichloro-2-butene	1,2,4-trimethylbenzene	
MI_SB02	MI_SB02_0.2	ES1323859018	30-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
MI_SB03	MI_SB03_0.2	ES1323858012	01-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
MI_SB03	MI_SB03_2.8	ES1325783004	21-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MI_SB04	MI_SB04_0.2	ES1322146008	09-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MI_SB04	MI_SB04_2.1	ES1326939001	21-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MI_SB05	MI_SB05_0.2	ES1323859016	30-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
MI_SB06	MI_SB06_0.2	ES1323858014	01-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
MI_SB06	MI_SB06_1.4	ES1325783005	21-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MI_SB07	MI_SB07_0.2	ES1322146001	08-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

**Statistical Summary**

	1,1,2-trichloroethane	1,1-dichloroethane	1,1-dichloroethene	1,1-dichloropropene	1,2,3-trichloropropane	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	1,2-dichloropropane	Bromodichloromethane	Bromoform	Carbon tetrachloride	Chlorodibromomethane	Chloroethane	Chloroform	Chloromethane	cis-1,2-dichloroethene	dis-1,3-dichloropropene	Dibromomethane	Hexachlorobutadiene	Trichloroethene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Vinyl chloride	cis-1,4-Dichloro-2-butene	Pentachloroethane	trans-1,4-Dichloro-2-butene	1,2,4-trimethylbenzene	
Number of Results	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Maximum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Average Concentration	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Median Concentration	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Standard Deviation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**Comments**

- #1 NEPC (2010) Ecological Investigation Level Calculator
- #2 CRC Care (2011) Intrusive Maintenance Workers, 2 to <4m, Sand Soils for Vapour Int
- #3 CRC Care (2011) Intrusive Maintenance Workers, 0 to <2m, Sand Soils for Vapour Int
- #4 CRC Care (2011) Intrusive Maintenance Workers, +4 m, Sand Soils for Vapour Intrusi
- #5 CRC Care (2011) Intrusive Maintenance Workers for Direct Contact
- #6 ASC NEPM (2013) HSL-D (Commercial/Industrial) for Direct Contact
- #7 ASC NEPM (2013) HSL-D (Commercial/Industrial) 2 to <4m, Sand Soils for Vapour I
- #8 ASC NEPM (2013) HSL-D (Commercial/Industrial) 1 to <2m, Sand Soils for Vapour I
- #9 ASC NEPM (2013) HSL-D (Commercial/Industrial) 0 to <1m, Sand Soils for Vapour I
- #10 ASC NEPM (2013) HSL-D (Commercial/Industrial) +4 m, Sand Soils for Vapour Int
- #11 ASC NEPM (2013) Health Investigation Level (HIL-D) Commercial/Industrial





Table 4i. AEC - MI Soil Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	MAH								Halogenated Benzenes								Halogenated Hydrocarbons					Solvents					Polychlorinated Biphenyls	
	1,3,5-trimethylbenzene	Isopropylbenzene	n-butylbenzene	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	Styrene	tert-butylbenzene	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	p-chlorotoluene	m-chlorotoluene	Bromobenzene	Chlorobenzene	1,2-dibromoethane	Bromomethane	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane	Methyl Ethyl Ketone	2-hexanone (MBK)	n-Methyl-2-pentanone	Carbon disulfide	Vinyl acetate	pCBs (Sum of total)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	5	0.5	5	5	5	5	0.5	5	0.1	
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND																												
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND																												
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND																												
Human Health - HSL-D - Vapour Intrusion + 4m SAND																												
Human Health - Intrusive - Vapour Intrusion 0-<2m																												
Human Health - Intrusive - Vapour Intrusion 2-<4m																												
Human Health - Intrusive - Vapour Intrusion + 4m																												
Human Health - Intrusive - Direct Contact																												
Human Health - Direct Contact - HIL-D																												7#11
NEPM (2013) EIL - Mt Piper Specific Commercial/Industrial (Aged)																												
NEPM (2013) ESL - Commercial & Industrial (Coarse)																												
NEPM (2013) ESL - Commercial & Industrial (Fine)																												

Location Code	Field ID	Sample Code	Sampled Date	1,3,5-trimethylbenzene	Isopropylbenzene	n-butylbenzene	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	Styrene	tert-butylbenzene	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	p-chlorotoluene	m-chlorotoluene	Bromobenzene	Chlorobenzene	1,2-dibromoethane	Bromomethane	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane	Methyl Ethyl Ketone	2-hexanone (MBK)	n-Methyl-2-pentanone	Carbon disulfide	Vinyl acetate	pCBs (Sum of total)
MI_SB02	MI_SB02_0.2	ES1323859018	30-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
MI_SB03	MI_SB03_0.2	ES1323858012	01-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
MI_SB03	MI_SB03_2.8	ES1325783004	21-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MI_SB04	MI_SB04_0.2	ES1322146008	09-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MI_SB04	MI_SB04_2.1	ES1326939001	21-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MI_SB05	MI_SB05_0.2	ES1323859016	30-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
MI_SB06	MI_SB06_0.2	ES1323858014	01-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
MI_SB06	MI_SB06_1.4	ES1325783005	21-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MI_SB07	MI_SB07_0.2	ES1322146001	08-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Statistical Summary																															
Number of Results	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<5	<0.5	<5	
Maximum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<5	<0.5	<5	
Average Concentration	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.5	2.5	0.25	2.5	2.5	2.5	2.5	2.5	0.25	2.5	
Median Concentration	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.5	2.5	0.25	2.5	2.5	2.5	2.5	2.5	0.25	2.5	
Standard Deviation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Comments

- #1 NEPC (2010) Ecological Investigation Level Calculator
- #2 CRC Care (2011) Intrusive Maintenance Workers, 2 to <4m, Sand Soils for Vapour Int
- #3 CRC Care (2011) Intrusive Maintenance Workers, 0 to <2m, Sand Soils for Vapour Int
- #4 CRC Care (2011) Intrusive Maintenance Workers, +4 m, Sand Soils for Vapour Intrusi
- #5 CRC Care (2011) Intrusive Maintenance Workers for Direct Contact
- #6 ASC NEPM (2013) HSL-D (Commercial/Industrial) for Direct Contact
- #7 ASC NEPM (2013) HSL-D (Commercial/Industrial) 2 to <4m, Sand Soils for Vapour I
- #8 ASC NEPM (2013) HSL-D (Commercial/Industrial) 1 to <2m, Sand Soils for Vapour I
- #9 ASC NEPM (2013) HSL-D (Commercial/Industrial) 0 to <1m, Sand Soils for Vapour I
- #10 ASC NEPM (2013) HSL-D (Commercial/Industrial) +4 m, Sand Soils for Vapour Int
- #11 ASC NEPM (2013) Health Investigation Level (HIL-D) Commercial/Industrial



Table 4j. AEC - MJ Soil Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	TRH											BTEX							Metals															
	TRH > C6-C9 Fraction	TRH > C10-C14 Fraction	TRH > C15-C28 Fraction	TRH > C29-C36 Fraction	TRH > C10-C36 Fraction	TRH > C6-C10 Fraction	TRH > C6-C10 less BTEX (F1)	TRH > C10-C16 Fraction	TRH > C10-C16 less Naphthalene (F2)	TRH > C16-C34 Fraction	TRH > C34-C40 Fraction	TRH > C10-C40 Fraction	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Total BTEX	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Selenium	Zinc	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
EQL	10	50	100	100	50	10	10	50	50	100	100	50	0.2	0.5	0.5	0.5	0.5	0.5	0.2	5	1	2	5	5	0.1	2	5	5	0.5	0.5	0.5	0.5	0.5	
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND							260	NL <sup>#9</sup>				3	NL <sup>#9</sup>	NL <sup>#9</sup>			230																	
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND							370	NL <sup>#8</sup>				3	NL <sup>#8</sup>	NL <sup>#8</sup>			NL <sup>#8</sup>																	
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND							630	NL <sup>#7</sup>				3	NL <sup>#7</sup>	NL <sup>#7</sup>			NL <sup>#7</sup>																	
Human Health - HSL-D - Vapour Intrusion + 4m SAND								NL <sup>#10</sup>	NL <sup>#10</sup>			3	NL <sup>#10</sup>	NL <sup>#10</sup>			NL <sup>#10</sup>																	
Human Health - Intrusive - Vapour Intrusion 0-<2m								NL <sup>#3</sup>	NL <sup>#3</sup>			77	NL <sup>#3</sup>	NL <sup>#3</sup>			NL <sup>#3</sup>																	
Human Health - Intrusive - Vapour Intrusion 2-<4m								NL <sup>#2</sup>	NL <sup>#2</sup>			160	NL <sup>#2</sup>	NL <sup>#2</sup>			NL <sup>#2</sup>																	
Human Health - Intrusive - Vapour Intrusion + 4m								NL <sup>#4</sup>	NL <sup>#4</sup>			NL <sup>#4</sup>	NL <sup>#4</sup>	NL <sup>#4</sup>	NL <sup>#4</sup>	NL <sup>#4</sup>	NL <sup>#4</sup>																	
Human Health - Intrusive - Direct Contact							82000	62000	85000	120000		1100	120000	85000			130000																	
Human Health - Direct Contact - HIL-D							26000	20000	27000	38000		430	99000	27000			81000			3000	900		240000	1500	730	6000	10000	400000						
NEPM (2013) EIL - Mt Piper Specific Commercial/Industrial (Aged)																				160		870	130	1800										
NEPM (2013) ESL - Commercial & Industrial (Coarse)							215	170	1700	3300		75	135	165			180																	1.4
NEPM (2013) ESL - Commercial & Industrial (Fine)										2500	6600		95	135	185			95																1.4

SampleCode	Field_ID	LocCode	Sample Date	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	6	<1	8	13	15	<0.1	9	<5	35	<0.5	<0.5	<0.5	<0.5	<0.5
ES1322434002	MD_MW01_1.0	MD_MW01	10-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	6	<1	8	13	15	<0.1	9	<5	35	<0.5	<0.5	<0.5	<0.5	<0.5
ES1323862027	MD_MW01_2.0	MD_MW01	30-Oct-13	<10	<50	120	<100	120	<10	<10	<50	<50	140	<100	140	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	12	<1	7	21	21	<0.1	22	<5	96	<0.5	<0.5	<0.5	<0.5	<0.5
ES1324471006	MD_MW02_1.0	MD_MW02	11-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	9	<1	8	10	14	<0.1	7	<5	27	<0.5	<0.5	<0.5	<0.5	<0.5
ES1324716002	MK_SB42_0.4	MK_SB42	11-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	17	<1	9	27	24	<0.1	76	<5	93	<0.5	<0.5	<0.5	<0.5	<0.5
ES1324716005	MK_SB24_0.4	MK_SB24	12-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	6	<1	3	8	13	<0.1	14	<5	23	<0.5	<0.5	<0.5	<0.5	<0.5
ES1325473009	MK_SB24_2.0	MK_SB24	20-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	9	<1	3	18	16	<0.1	4	<5	26	<0.5	<0.5	<0.5	<0.5	<0.5
ES1325783001	MK_SB42_3.5	MK_SB42	21-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	12	<1	10	10	18	<0.1	5	<5	16	<0.5	<0.5	<0.5	<0.5	<0.5

Statistical Summary	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
Number of Results	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
Number of Detects	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	7	0	7	7	7	0	7	0	7	0	0	0	0
Minimum Concentration	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	6	<1	3	8	13	<0.1	4	<5	16	<0.5	<0.5	<0.5	<0.5	<0.5
Maximum Concentration	<10	<50	120	<100	120	<10	<10	<50	<50	140	<100	140	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	17	<1	10	27	24	<0.1	76	<5	96	<0.5	<0.5	<0.5	<0.5	<0.5
Average Concentration	5	25	60	50	39	5	5	25	25	63	50	41	0.1	0.25	0.25	0.25	0.25	0.25	0.25	0.1	10	0.5	6.9	15	17	0.05	20	2.5	45	0.25	0.25	0.25	0.25	0.25	
Median Concentration	5	25	50	50	25	5	5	25	25	50	50	25	0.1	0.25	0.25	0.25	0.25	0.25	0.1	9	0.5	8	13	16	0.05	9	2.5	27	0.25	0.25	0.25	0.25	0.25		
Standard Deviation	0	0	26	0	36	0	0	0	0	34	0	43	0	0	0	0	0	0	0	3.9	0	2.8	7	4	0	26	0	34	0	0	0	0	0		
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	



Table 4j. AEC - MJ Soil Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	PAH														Phenols																					
	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Carcinogenic PAHs (as B(a)P TEQ (half LOR))	Carcinogenic PAHs (as B(a)P TEQ (LOR))	Naphthalene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	PAHs (Sum of total)	Carcinogenic PAHs (as BaP TEQ)	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,4-dimethylphenol	2,6-dichlorophenol	2-chlorophenol	2-methylphenol	2-nitrophenol	3-&4-methylphenol	4-chloro-3-methylphenol	Pentachlorophenol	Phenol	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,1-dichloroethane			
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND						NL <sup>#9</sup>																														
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND						NL <sup>#8</sup>																														
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND						NL <sup>#7</sup>																														
Human Health - HSL-D - Vapour Intrusion + 4m SAND						NL <sup>#10</sup>																														
Human Health - Intrusive - Vapour Intrusion 0-<2m						NL <sup>#3</sup>																														
Human Health - Intrusive - Vapour Intrusion 2-<4m						NL <sup>#2</sup>																														
Human Health - Intrusive - Vapour Intrusion + 4m						NL <sup>#4</sup>																														
Human Health - Intrusive - Direct Contact						29000																														
Human Health - Direct Contact - HIL-D						11000								4000	40											660	240000									
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)						370																														
NEPM (2013) ESL - Commercial & Industrial (Coarse)																																				
NEPM (2013) ESL - Commercial & Industrial (Fine)																																				

SampleCode	Field_ID	LocCode	Sample Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
ES1322434002	MD_MW01_1.0	MD_MW01	10-Oct-13	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
ES1323862027	MD_MW01_2.0	MD_MW01	30-Oct-13	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	0.7	<0.5	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
ES1324471006	MD_MW02_1.0	MD_MW02	11-Nov-13	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
ES1324716002	MK_SB42_0.4	MK_SB42	11-Nov-13	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	0.8	<0.5	1.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
ES1324716005	MK_SB24_0.4	MK_SB24	12-Nov-13	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
ES1325473009	MK_SB24_2.0	MK_SB24	20-Nov-13	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
ES1325783001	MK_SB42_3.5	MK_SB42	21-Nov-13	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Statistical Summary	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32		
Number of Results	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Number of Detects	0	0	0	7	7	0	0	0	2	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Maximum Concentration	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	0.8	<0.5	1.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Average Concentration	0.25	0.25	0.25	0.6	1.2	0.25	0.25	0.25	0.34	0.25	0.25	0.39	0.25	0.55	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	
Median Concentration	0.25	0.25	0.25	0.6	1.2	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	
Standard Deviation	0	0	0	0	0	0	0	0	0.15	0	0	0.25	0	0.52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Table 4j. AEC - MJ Soil Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	Chlorinated Hydrocarbons																				VOCs			MAH														
	1,1-dichloropropene	1,2,3-trichloropropene	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	2,2-dichloropropane	Bromodichloromethane	Bromoform	Carbon tetrachloride	Chlorodibromomethane	Chloroethane	Chloroform	Chloromethane	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Dibromomethane	Hexachlorobutadiene	Trichloroethene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Vinyl chloride	cis-1,4-Dichloro-2-butene	Pentachloroethane	trans-1,4-Dichloro-2-butene	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	Isopropylbenzene	n-butylbenzene	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	Styrene				
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	0.5	5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND																																						
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND																																						
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND																																						
Human Health - HSL-D - Vapour Intrusion + 4m SAND																																						
Human Health - Intrusive - Vapour Intrusion 0-<2m																																						
Human Health - Intrusive - Vapour Intrusion 2-<4m																																						
Human Health - Intrusive - Vapour Intrusion + 4m																																						
Human Health - Intrusive - Direct Contact																																						
Human Health - Direct Contact - HIL-D																																						
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)																																						
NEPM (2013) ESL - Commercial & Industrial (Coarse)																																						
NEPM (2013) ESL - Commercial & Industrial (Fine)																																						

SampleCode	Field_ID	LocCode	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
ES1322434002	MD_MW01_1.0	MD_MW01	10-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
ES1323862027	MD_MW01_2.0	MD_MW01	30-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ES1324471006	MD_MW02_1.0	MD_MW02	11-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
ES1324716002	MK_SB42_0.4	MK_SB42	11-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ES1324716005	MK_SB24_0.4	MK_SB24	12-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ES1325473009	MK_SB24_2.0	MK_SB24	20-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ES1325783001	MK_SB42_3.5	MK_SB42	21-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Statistical Summary																																						
Number of Results	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Maximum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Average Concentration																																						
Median Concentration	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	
Standard Deviation																																						
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	





Table 4j. AEC - MJ Soil Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	Halogenated Benzenes										Halogenated Hydrocarbons					Solvents					Polychlorinated Biphenyls	
	tert-butylbenzene	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	2-chlorotoluene	4-chlorotoluene	Bromobenzene	Chlorobenzene	1,2-dibromoethane	Bromomethane	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane	Methyl Ethyl Ketone	2-hexanone (MBK)	4-Methyl-2-pentanone	Carbon disulfide	Vinyl acetate	PCBs (Sum of total)	
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	5	0.5	5	5	5	5	0.5	5		0.1	
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND																						
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND																						
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND																						
Human Health - HSL-D - Vapour Intrusion + 4m SAND																						
Human Health - Intrusive - Vapour Intrusion 0-<2m																						
Human Health - Intrusive - Vapour Intrusion 2-<4m																						
Human Health - Intrusive - Vapour Intrusion + 4m																						
Human Health - Intrusive - Direct Contact																						
Human Health - Direct Contact - HIL-D																						7
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)																						
NEPM (2013) ESL - Commercial & Industrial (Coarse)																						
NEPM (2013) ESL - Commercial & Industrial (Fine)																						

SampleCode	Field_ID	LocCode	Sample Date																			
ES1322434002	MD_MW01_1.0	MD_MW01	10-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<0.5	<5	<0.1
ES1323862027	MD_MW01_2.0	MD_MW01	30-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ES1324471006	MD_MW02_1.0	MD_MW02	11-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<0.5	<5	-
ES1324716002	MK_SB42_0.4	MK_SB42	11-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ES1324716005	MK_SB24_0.4	MK_SB24	12-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ES1325473009	MK_SB24_2.0	MK_SB24	20-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ES1325783001	MK_SB42_3.5	MK_SB42	21-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Statistical Summary																					
Number of Results	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<0.5	<5	<0.1
Maximum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<0.5	<5	<0.1
Average Concentration																					
Median Concentration	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.5	2.5	0.25	2.5	2.5	2.5	0.25	2.5	0.05
Standard Deviation																					
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Table 4k. AEC - MK Soil Chemistry Summary  
Mt Piper Power Station - Stege 2 ESA  
Project Symphony - 0207423

	TRH											BTEX						Metals												
	TRH > C6-C9 Fraction	TRH > C10-C14 Fraction	TRH > C15-C28 Fraction	TRH > C29-C36 Fraction	TRH > C10-C36 Fraction	TRH > C6-C10 Fraction	TRH > C6-C10 less BTEX (F1)	TRH > C10-C16 Fraction	TRH > C10-C16 less Naphthalene (F2)	TRH > C16-C34 Fraction	TRH > C34-C40 Fraction	TRH > C10-C40 Fraction	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Total BTEX	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Selenium	Zinc	Acenaphthene	
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
EQI	10	50	100	100	50	10	10	50	50	100	100	50	0.2	0.5	0.5	0.5	0.5	0.5	0.2	5	1	2	5	5	0.1	2	5	5	0.5	
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND							260 <sup>#9</sup>	NL <sup>#9</sup>					3 <sup>#9</sup>	NL <sup>#9</sup>	NL <sup>#9</sup>			230 <sup>#9</sup>												
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND							370 <sup>#8</sup>	NL <sup>#8</sup>					3 <sup>#8</sup>	NL <sup>#8</sup>	NL <sup>#8</sup>			NL <sup>#8</sup>												
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND							630 <sup>#7</sup>	NL <sup>#7</sup>					3 <sup>#7</sup>	NL <sup>#7</sup>	NL <sup>#7</sup>			NL <sup>#7</sup>												
Human Health - HSL-D - Vapour Intrusion + 4m SAND							NL <sup>#10</sup>	NL <sup>#10</sup>					3 <sup>#10</sup>	NL <sup>#10</sup>	NL <sup>#10</sup>			NL <sup>#10</sup>												
Human Health - Intrusive - Vapour Intrusion 0-<2m							NL <sup>#3</sup>	NL <sup>#3</sup>					77 <sup>#3</sup>	NL <sup>#3</sup>	NL <sup>#3</sup>			NL <sup>#3</sup>												
Human Health - Intrusive - Vapour Intrusion 2-<4m							NL <sup>#2</sup>	NL <sup>#2</sup>					160 <sup>#2</sup>	NL <sup>#2</sup>	NL <sup>#2</sup>			NL <sup>#2</sup>												
Human Health - Intrusive - Vapour Intrusion + 4m							NL <sup>#4</sup>	NL <sup>#4</sup>					NL <sup>#4</sup>	NL <sup>#4</sup>	NL <sup>#4</sup>			NL <sup>#4</sup>												
Human Health - Intrusive - Direct Contact							82000 <sup>#5</sup>	62000 <sup>#5</sup>	85000 <sup>#5</sup>	120000 <sup>#5</sup>			1100 <sup>#5</sup>	120000 <sup>#5</sup>	85000 <sup>#5</sup>			130000 <sup>#5</sup>												
Human Health - Direct Contact - HIL-D							26000 <sup>#6</sup>	20000 <sup>#6</sup>	27000 <sup>#6</sup>	38000 <sup>#6</sup>			430 <sup>#6</sup>	99000 <sup>#6</sup>	27000 <sup>#6</sup>			81000 <sup>#6</sup>			3000 <sup>#11</sup>	900 <sup>#11</sup>		240000 <sup>#11</sup>	1500 <sup>#11</sup>	730 <sup>#11</sup>	6000 <sup>#11</sup>	10000 <sup>#11</sup>	40000 <sup>#11</sup>	
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)																														
NEPM (2013) ESL - Commercial & Industrial (Coarse)							215		170	1700	3300		75	135	165			180		160 <sup>#1</sup>		870 <sup>#1</sup>	130 <sup>#1</sup>	1800 <sup>#1</sup>		160 <sup>#1</sup>		280 <sup>#1</sup>		
NEPM (2013) ESL - Commercial & Industrial (Fine)										2500	6600		95	135	185			95												

Location Code	Field ID	Sample Code	Sampled Date	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	7	<1	8	11	13	<0.1	16	<5	39	<0.5
MK_SB01	MK_SB01_0.2	ES1324472009	08-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	7	<1	8	11	13	<0.1	16	<5	39	<0.5
MK_SB02	MK_SB02_0.5	ES1323862009	28-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	7	11	10	<0.1	11	<5	67	<0.5
MK_SB02	MK_SB02_1.5	ES1323862034	31-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	9	<1	10	24	27	<0.1	24	<5	46	<0.5
MK_SB03	MK_SB03_0.5	ES1324472002	08-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	<2	<5	10	<0.1	4	<5	31	<0.5
MK_SB04	MK_SB04_0.2	ES1323862002	28-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	7	<1	12	16	18	<0.1	25	<5	111	<0.5
MK_SB04	MK_SB04_2.8	ES1323862025	30-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	8	7	9	<0.1	8	<5	81	<0.5
MK_SB05	MK_SB05_0.5	ES1323862006	28-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	17	16	17	<0.1	36	<5	176	<0.5
MK_SB06	MK_SB06_0.2	ES1323862008	28-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	5	<5	6	<0.1	3	<5	45	<0.5
MK_SB08	MK_SB08_0.2	ES1324472006	08-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	6	<1	5	8	12	<0.1	13	<5	46	<0.5
MK_SB09	MK_SB09_0.1	ES1322434005	10-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	28	16	9	<0.1	14	<5	37	<0.5
MK_SB09	MK_SB09_1.15	ES1323862026	30-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	16	<1	9	9	12	<0.1	19	<5	66	<0.5
MK_SB10	MK_SB10_1.2	ES1322434009	11-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	4	<5	9	<0.1	3	<5	6	<0.5
MK_SB10	MK_SB10_1.5	ES1322662031	14-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	6	<1	16	43	35	<0.1	17	<5	34	<0.5
MK_SB11	MK_SB11_1.0	ES1323862001	28-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	10	<1	9	11	13	<0.1	17	<5	69	<0.5
MK_SB12	MK_SB12_0.2	ES1323031003	17-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	6	9	12	<0.1	9	<5	87	<0.5
MK_SB13	MK_SB13_1.0	ES1323031001	17-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	<2	11	15	<0.1	6	<5	62	<0.5
MK_SB13	MK_SB13_1.6	ES1324470034	08-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	<2	16	14	<0.1	8	<5	40	<0.5
MK_SB14	MK_SB14_1.0	ES1322434007	10-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	6	21	18	<0.1	6	<5	26	<0.5
MK_SB15	MK_SB15_0.1	ES1322434003	10-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	34	19	8	<0.1	16	<5	42	<0.5
MK_SB16	MK_SB16_0.5	ES1322434004	10-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	9	<1	11	20	21	<0.1	33	<5	52	<0.5
MK_SB16	MK_SB16_1.5	ES1322662003	14-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	27	<1	12	12	17	<0.1	46	<5	84	<0.5
MK_SB17	MK_SB17_1.5	ES1323862024	30-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	3	<5	6	<0.1	<2	<5	34	<0.5
MK_SB18	MK_SB18_0.1	ES1323031014	18-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	5	6	10	<0.1	3	<5	90	<0.5
MK_SB19	MK_SB19_0.1	ES1323031015	18-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	7	<1	8	12	14	<0.1	15	<5	38	<0.5
MK_SB20	MK_SB20_0.1	ES1323031016	18-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	7	<1	15	11	20	<0.1	22	<5	43	<0.5
MK_SB22	MK_SB22_1.5	ES1324470015	06-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	&														



Table 4k. AEC - MK Soil Chemistry Summary  
Mt Piper Power Station - Stege 2 ESA  
Project Symphony - 0207423

	TRH												BTEX							Metals										
	TRH > C6-C9 Fraction	TRH > C10-C14 Fraction	TRH > C15-C28 Fraction	TRH > C29-C36 Fraction	TRH > C10-C36 Fraction	TRH > C6-C10 Fraction	TRH > C6-C10 less BTEX (F1)	TRH > C10-C16 Fraction	TRH > C10-C16 less Naphthalene (F2)	TRH > C16-C34 Fraction	TRH > C34-C40 Fraction	TRH > C10-C40 Fraction	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Total BTEX	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Selenium	Zinc	Acenaphthene	
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
EQI	10	50	100	100	50	10	10	50	50	100	100	50	0.2	0.5	0.5	0.5	0.5	0.5	0.2	5	1	2	5	5	0.1	2	5	5	0.5	
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND							260 <sup>#9</sup>	NL <sup>#9</sup>					3 <sup>#9</sup>	NL <sup>#9</sup>	NL <sup>#9</sup>			230 <sup>#9</sup>												
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND							370 <sup>#8</sup>	NL <sup>#8</sup>					3 <sup>#8</sup>	NL <sup>#8</sup>	NL <sup>#8</sup>			NL <sup>#8</sup>												
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND							630 <sup>#7</sup>	NL <sup>#7</sup>					3 <sup>#7</sup>	NL <sup>#7</sup>	NL <sup>#7</sup>			NL <sup>#7</sup>												
Human Health - HSL-D - Vapour Intrusion + 4m SAND							NL <sup>#10</sup>	NL <sup>#10</sup>					3 <sup>#10</sup>	NL <sup>#10</sup>	NL <sup>#10</sup>			NL <sup>#10</sup>												
Human Health - Intrusive - Vapour Intrusion 0-<2m							NL <sup>#3</sup>	NL <sup>#3</sup>					77 <sup>#3</sup>	NL <sup>#3</sup>	NL <sup>#3</sup>			NL <sup>#3</sup>												
Human Health - Intrusive - Vapour Intrusion 2-<4m							NL <sup>#2</sup>	NL <sup>#2</sup>					160 <sup>#2</sup>	NL <sup>#2</sup>	NL <sup>#2</sup>			NL <sup>#2</sup>												
Human Health - Intrusive - Vapour Intrusion + 4m							NL <sup>#4</sup>	NL <sup>#4</sup>					NL <sup>#4</sup>	NL <sup>#4</sup>	NL <sup>#4</sup>			NL <sup>#4</sup>												
Human Health - Intrusive - Direct Contact							82000 <sup>#5</sup>	62000 <sup>#5</sup>	85000 <sup>#5</sup>	120000 <sup>#5</sup>			1100 <sup>#5</sup>	120000 <sup>#5</sup>	85000 <sup>#5</sup>			130000 <sup>#5</sup>												
Human Health - Direct Contact - HIL-D							26000 <sup>#6</sup>	20000 <sup>#6</sup>	27000 <sup>#6</sup>	38000 <sup>#6</sup>			430 <sup>#6</sup>	99000 <sup>#6</sup>	27000 <sup>#6</sup>			81000 <sup>#6</sup>			3000 <sup>#11</sup>	900 <sup>#11</sup>		240000 <sup>#11</sup>	1500 <sup>#11</sup>	730 <sup>#11</sup>	6000 <sup>#11</sup>	10000 <sup>#11</sup>	40000 <sup>#11</sup>	
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)																														
NEPM (2013) ESL - Commercial & Industrial (Coarse)							215		170	1700	3300		75	135	165			180		160 <sup>#1</sup>		870 <sup>#1</sup>	130 <sup>#1</sup>	1800 <sup>#1</sup>		160 <sup>#1</sup>			280 <sup>#1</sup>	
NEPM (2013) ESL - Commercial & Industrial (Fine)										2500	6600		95	135	185			95												

Location Code	Field ID	Sample Code	Sampled Date	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	7	<1	9	8	18	<0.1	13	<5	23	<0.5
MK_SB28	MK_SB28_0.2	ES1323031012	17-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	7	<1	9	8	18	<0.1	13	<5	23	<0.5
MK_SB30	MK_SB30_0.5	ES1324716004	12-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	6	<1	<2	6	12	<0.1	5	<5	29	<0.5
MK_SB30	MK_SB30_2.7	ES1325473010	20-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	11	<1	16	11	18	<0.1	18	<5	63	<0.5
MK_SB31	MK_SB31-0.2	ES1322662009	15-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	5	<1	9	15	17	<0.1	16	<5	36	<0.5
MK_SB32	MK_SB32-0.1	ES1322662008	15-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	10	<1	7	19	23	<0.1	43	<5	190	<0.5
MK_SB33	MK_SB33_1.5	ES1324470013	06-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	12	<1	50	204	139	<0.1	9	<5	24	<0.5
MK_SB33	MK_SB33_1.0	ES1323031007	17-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	12	6	11	<0.1	4	<5	12	<0.5
MK_SB34	MK_SB34_2.0	ES1324470010	06-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	6	<1	7	12	13	<0.1	29	<5	50	<0.5
MK_SB34	MK_SB34_0.8	ES1323031009	17-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	6	<1	8	7	21	<0.1	11	<5	26	<0.5
MK_SB35	MK_SB35_1.0	ES1323031011	17-Oct-13	<10	<50	310	<100	310	<10	<10	120	120	260	<100	380	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	18	<1	9	29	37	<0.1	54	<5	90	<0.5
MK_SB35	MK_SB35_3.0	ES1324470008	06-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	18	<1	13	32	32	<0.1	43	<5	92	<0.5
MK_SB36	MK_SB36-0.1	ES1322662010	15-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	8	<1	17	27	32	<0.1	17	<5	31	<0.5
MK_SB37	MK_SB37-1.0	ES1322662012	15-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	6	<1	13	14	21	<0.1	<2	<5	6	<0.5
MK_SB38	MK_SB38_3.8	ES1324470021	07-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	14	24	13	<0.1	<2	<5	13	<0.5
MK_SB38	MK_SB38-0.5	ES1322662013	15-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	18	1	13	23	21	<0.1	54	<5	77	<0.5
MK_SB39	MK_SB39-1.0	ES1322662007	15-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	21	1	15	25	26	<0.1	64	<5	117	<0.5
MK_SB39	MK_SB39-5.0	ES1322662019	16-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	9	<1	8	12	17	<0.1	24	<5	46	<0.5
MK_SB40	MK_SB40_2.0	ES1324470019	07-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	14	<1	17	21	20	<0.1	59	<5	82	<0.5
MK_SB40	MK_SB40-0.7	ES1322662006	15-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	9	<1	10	9	18	<0.1	28	<5	49	<0.5
MK_SB42	MK_SB42_0.4	ES1324716002	11-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	17	<1	9	27	24	<0.1	76	<5	93	<0.5
MK_SB42	MK_SB42_3.5	ES1325783001	21-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	12	<1	10	10	18	<0.1	5	<5	16	<0.5
MK_SB43	MK_SB43_0.2	ES1324233005	06-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	12	<1	11	23	25	<0.1	34	<5	130	<0.5
MK_SB43	MK_SB43_1.6	ES1325473008	20-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	13	<1	21	21	25	<0.1	57	<5	70	<0.5
MK_SB44	MK_SB44_0																															



Table 4k. AEC - MK Soil Chemistry Summary  
Mt Piper Power Station - Stege 2 ESA  
Project Symphony - 0207423

	TRH												BTEX						Metals											
	TRH > C6-C9 Fraction	TRH > C10-C14 Fraction	TRH > C15-C28 Fraction	TRH > C29-C36 Fraction	TRH > C10-C36 Fraction	TRH > C6-C10 Fraction	TRH > C6-C10 less BTEX (F1)	TRH > C10-C16 Fraction	TRH > C10-C16 less Naphthalene (F2)	TRH > C16-C34 Fraction	TRH > C34-C40 Fraction	TRH > C10-C40 Fraction	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Total BTEX	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Selenium	Zinc	Acenaphthene	
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
EQI	10	50	100	100	50	10	10	50	50	100	100	50	0.2	0.5	0.5	0.5	0.5	0.5	0.2	5	1	2	5	5	0.1	2	5	5	0.5	
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND							260 <sup>#9</sup>	NL <sup>#9</sup>					3 <sup>#9</sup>	NL <sup>#9</sup>	NL <sup>#9</sup>			230 <sup>#9</sup>												
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND							370 <sup>#8</sup>	NL <sup>#8</sup>					3 <sup>#8</sup>	NL <sup>#8</sup>	NL <sup>#8</sup>			NL <sup>#8</sup>												
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND							630 <sup>#7</sup>	NL <sup>#7</sup>					3 <sup>#7</sup>	NL <sup>#7</sup>	NL <sup>#7</sup>			NL <sup>#7</sup>												
Human Health - HSL-D - Vapour Intrusion + 4m SAND							NL <sup>#10</sup>	NL <sup>#10</sup>					3 <sup>#10</sup>	NL <sup>#10</sup>	NL <sup>#10</sup>			NL <sup>#10</sup>												
Human Health - Intrusive - Vapour Intrusion 0-<2m							NL <sup>#3</sup>	NL <sup>#3</sup>					77 <sup>#3</sup>	NL <sup>#3</sup>	NL <sup>#3</sup>			NL <sup>#3</sup>												
Human Health - Intrusive - Vapour Intrusion 2-<4m							NL <sup>#2</sup>	NL <sup>#2</sup>					160 <sup>#2</sup>	NL <sup>#2</sup>	NL <sup>#2</sup>			NL <sup>#2</sup>												
Human Health - Intrusive - Vapour Intrusion + 4m							NL <sup>#4</sup>	NL <sup>#4</sup>					NL <sup>#4</sup>	NL <sup>#4</sup>	NL <sup>#4</sup>			NL <sup>#4</sup>												
Human Health - Intrusive - Direct Contact							82000 <sup>#5</sup>	62000 <sup>#5</sup>	85000 <sup>#5</sup>	120000 <sup>#5</sup>			1100 <sup>#5</sup>	120000 <sup>#5</sup>	85000 <sup>#5</sup>			130000 <sup>#5</sup>												
Human Health - Direct Contact - HIL-D							26000 <sup>#6</sup>	20000 <sup>#6</sup>	27000 <sup>#6</sup>	38000 <sup>#6</sup>			430 <sup>#6</sup>	99000 <sup>#6</sup>	27000 <sup>#6</sup>			81000 <sup>#6</sup>			3000 <sup>#11</sup>	900 <sup>#11</sup>		24000 <sup>#11</sup>	1500 <sup>#11</sup>	730 <sup>#11</sup>	6000 <sup>#11</sup>	10000 <sup>#11</sup>	40000 <sup>#11</sup>	
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)																														
NEPM (2013) ESL - Commercial & Industrial (Coarse)							215		170	1700	3300		75	135	165			180		160 <sup>#1</sup>		870 <sup>#1</sup>	130 <sup>#1</sup>	1800 <sup>#1</sup>		160 <sup>#1</sup>		280 <sup>#1</sup>		
NEPM (2013) ESL - Commercial & Industrial (Fine)										2500	6600		95	135	185			95												

Location Code	Field ID	Sample Code	Sampled Date	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	27	<5	9	<0.1	7	<5	31	<0.5
MK_SB51	MK_SB51_3.0	ES1323862036	31-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	27	<5	9	<0.1	7	<5	31	<0.5
MK_SB52	MK_SB52-0.1	ES1322662001	14-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	5	<1	<2	<5	8	<0.1	6	<5	38	<0.5
MK_SB54	MK_SB54_0.15	ES1324470035	11-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	13	6	13	<0.1	9	<5	45	<0.5
MK_SB54	MK_SB54_1.0	ES1324470036	11-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	13	<5	10	<0.1	<2	<5	7	<0.5
MK_SB55	MK_SB55-0.2	ES1322662015	15-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	21	2	8	29	31	<0.1	87	<5	176	<0.5
MK_SB56	MK_SB56-0.2	ES1322662014	15-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	9	<1	12	14	18	<0.1	21	<5	43	<0.5
MK_SB57	MK_SB57_3.0	ES1324470022	07-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	13	<1	9	18	20	<0.1	35	<5	64	<0.5
MK_SB57	MK_SB57-1.0	ES1322662016	15-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	20	<1	9	6	11	<0.1	15	<5	31	<0.5
MK_SB58	MK_SB58_2.0	ES1324470016	07-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	20	<1	22	16	24	<0.1	90	<5	111	<0.5
MK_SB58	MK_SB58_0.1	ES1323862018	29-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	8	<1	13	18	27	<0.1	54	<5	80	<0.5
MK_SB59	MK_SB59-0.2	ES1322662005	15-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	15	1	17	17	21	<0.1	47	<5	80	<0.5
MK_SB61	MK_SB61_0.4	ES1325218005	14-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	100	<100	100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	17	<1	5	24	16	<0.1	13	<5	47	<0.5
MK_SB62	MK_SB62_0.2	ES1324233004	06-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	100	<100	100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	10	<1	15	19	17	<0.1	43	<5	76	<0.5
MK_SB63	MK_SB63_0.03	ES1325970009	27-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	1	24	19	10	<0.1	14	<5	131	<0.5
MK_SB64	MK_SB64_0.05	ES1325970008	27-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	9	13	12	<0.1	7	<5	51	<0.5
MK_SB65	MK_SB65_1.0	ES1324473009	07-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	7	<1	4	13	16	<0.1	10	<5	19	<0.5
MK_SB65	MK_SB65_3.5	ES1325783006	22-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	27	<1	12	11	20	<0.1	43	<5	80	<0.5
MK_SB66	MK_SB66_0.05	ES1325970005	27-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	9	18	11	<0.1	7	<5	62	<0.5
MK_SB67	MK_SB67_0.05	ES1325970006	27-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	6	13	16	<0.1	11	<5	52	<0.5
MK_SB68	MK_SB68-0.5	ES1322662018	15-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	14	1	16	23	21	<0.1	60	<5	113	<0.5
MK_SB68	MK_SB68-4.0	ES1322662020	16-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	17	1	16	22	23	<0.1	61	<5	92	<0.5
MK_SB69	MK_SB69_0.05	ES1325970013	27-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	31	18	10	<0.1	17	<5	77	<0.5
MK_SB71	MK_SB71_0.5	ES1324716006	12-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	12	<1	14	22	28	<0.1	39	<5	79	<0.5
M																																



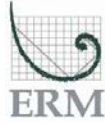


Table 4k. AEC - MK Soil Chemistry Summary  
Mt Piper Power Station - Stege 2 ESA  
Project Symphony - 0207423

	TRH											BTEX							Metals										
	TRH > C6-C9 Fraction	TRH > C10-C14 Fraction	TRH > C15-C28 Fraction	TRH > C29-C36 Fraction	TRH > C10-C36 Fraction	TRH > C6-C10 Fraction	TRH > C6-C10 less BTEX (F1)	TRH > C10-C16 Fraction	TRH > C10-C16 less Naphthalene (F2)	TRH > C16-C34 Fraction	TRH > C34-C40 Fraction	TRH > C10-C40 Fraction	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Total BTEX	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Selenium	Zinc	Acenaphthene
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	10	50	100	100	50	10	10	50	50	100	100	50	0.2	0.5	0.5	0.5	0.5	0.5	0.2	5	1	2	5	5	0.1	2	5	5	0.5
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND							260 <sup>#9</sup>	NL <sup>#9</sup>					3 <sup>#9</sup>	NL <sup>#9</sup>	NL <sup>#9</sup>			230 <sup>#9</sup>											
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND							370 <sup>#8</sup>	NL <sup>#8</sup>					3 <sup>#8</sup>	NL <sup>#8</sup>	NL <sup>#8</sup>			NL <sup>#8</sup>											
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND							630 <sup>#7</sup>	NL <sup>#7</sup>					3 <sup>#7</sup>	NL <sup>#7</sup>	NL <sup>#7</sup>			NL <sup>#7</sup>											
Human Health - HSL-D - Vapour Intrusion + 4m SAND							NL <sup>#10</sup>	NL <sup>#10</sup>					3 <sup>#10</sup>	NL <sup>#10</sup>	NL <sup>#10</sup>			NL <sup>#10</sup>											
Human Health - Intrusive - Vapour Intrusion 0-<2m							NL <sup>#3</sup>	NL <sup>#3</sup>					77 <sup>#3</sup>	NL <sup>#3</sup>	NL <sup>#3</sup>			NL <sup>#3</sup>											
Human Health - Intrusive - Vapour Intrusion 2-<4m							NL <sup>#2</sup>	NL <sup>#2</sup>					160 <sup>#2</sup>	NL <sup>#2</sup>	NL <sup>#2</sup>			NL <sup>#2</sup>											
Human Health - Intrusive - Vapour Intrusion + 4m							NL <sup>#4</sup>	NL <sup>#4</sup>					NL <sup>#4</sup>	NL <sup>#4</sup>	NL <sup>#4</sup>			NL <sup>#4</sup>											
Human Health - Intrusive - Direct Contact							82000 <sup>#5</sup>	62000 <sup>#5</sup>	85000 <sup>#5</sup>	120000 <sup>#5</sup>			1100 <sup>#5</sup>	120000 <sup>#5</sup>	85000 <sup>#5</sup>			130000 <sup>#5</sup>											
Human Health - Direct Contact - HIL-D							26000 <sup>#6</sup>	20000 <sup>#6</sup>	27000 <sup>#6</sup>	38000 <sup>#6</sup>			430 <sup>#6</sup>	99000 <sup>#6</sup>	27000 <sup>#6</sup>			81000 <sup>#6</sup>		3000 <sup>#11</sup>	900 <sup>#11</sup>		240000 <sup>#11</sup>	1500 <sup>#11</sup>	730 <sup>#11</sup>	6000 <sup>#11</sup>	10000 <sup>#11</sup>	40000 <sup>#11</sup>	
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)																				160 <sup>#1</sup>		870 <sup>#1</sup>	130 <sup>#1</sup>	1800 <sup>#1</sup>		160 <sup>#1</sup>		280 <sup>#1</sup>	
NEPM (2013) ESL - Commercial & Industrial (Coarse)							215		170	1700	3300		75	135	165			180											
NEPM (2013) ESL - Commercial & Industrial (Fine)										2500	6600		95	135	185			95											

Location Code	Field ID	Sample Code	Sampled Date	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	11	<1	11	22	25	<0.1	20	<5	35	<0.5
MK_SB82	MK_SB82_3.9	ES1324470001	06-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	11	<1	11	22	25	<0.1	20	<5	35	<0.5
MK_SB82	MK_SB82_0.2	ES1323862014	29-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	5	<1	12	8	16	<0.1	19	<5	66	<0.5
MK_SB84	MK_SB84_0.2	ES1324233003	06-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	8	<1	10	15	17	<0.1	21	<5	59	<0.5
MK_SB86	MK_SB86_1.5	ES1324470004	06-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	7	<1	9	11	17	<0.1	24	<5	35	<0.5
MK_SB86	MK_SB86_0.5	ES1323862016	29-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	19	<1	9	21	19	0.1	63	<5	116	<0.5
MK_SB87	MK_SB87_1.0	ES1323862004	28-Oct-13	13	730	460	<100	1190	55	54	860	860	300	<100	1160	<0.2	<0.5	<0.5	<0.5	0.9	0.9 - 1.15	0.9	12	<1	8	13	23	<0.1	18	<5	99	<0.5
MK_SB87	MK_SB87_3.0	ES1323862028	31-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	3	19	19	<0.1	3	<5	88	<0.5

Statistical Summary	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106
Number of Results	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106
Number of Detects	1	1	2	0	2	1	1	2	2	4	0	0	0	0	2	2	2	2	77	7	101	99	106	1	102	0	106	0					
Minimum Concentration	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	<2	<5	6	<0.1	<2	<5	6	<0.5		
Maximum Concentration	13	730	460	<100	1190	55	54	860	860	300	<100	1160	<0.2	<0.5	<0.5	<0.5	0.9	1.15	0.9	60	2	50	204	139	0.1	115	<5	190	<0.5				
Average Concentration	5.1	32	56	50	39	5.5	5.5	34	34	55	50	40	0.1	0.25	0.25	0.25	0.26	0.26	0.11	9.7	0.54	12	18	20	0.05	27	2.5	66	0.25				
Median Concentration	5	25	50	50	25	5	5	25	25	50	50	25	0.1	0.25	0.25	0.25	0.25	0.25	0.1	8	0.5	10	16	18	0.05	18.5	2.5	57	0.25				
Standard Deviation	0.78	68	47	0	116	4.9	4.8	82	82	32	0	115	0	0	0	0	0.071	0.088	0.091	8.2	0.18	8.8	20	14	0.0049	23	0	39	0				
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

- Comments**
- #1 NEPC (2010) Ecological Investigation Level Calculator
  - #2 CRC Care (2011) Intrusive Maintenance Workers, 2 to <4m, Sand Soils for Vapour Intrusion
  - #3 CRC Care (2011) Intrusive Maintenance Workers, 0 to <2m, Sand Soils for Vapour Intrusion
  - #4 CRC Care (2011) Intrusive Maintenance Workers, +4 m, Sand Soils for Vapour Intrusion
  - #5 CRC Care (2011) Intrusive Maintenance Workers for Direct Contact
  - #6 ASC NEPM (2013) HSL-D (Commercial/Industrial) for Direct Contact
  - #7 ASC NEPM (2013) HSL-D (Commercial/Industrial) 2 to <4m, Sand Soils for Vapour Intrusion
  - #8 ASC NEPM (2013) HSL-D (Commercial/Industrial) 1 to <2m, Sand Soils for Vapour Intrusion
  - #9 ASC NEPM (2013) HSL-D (Commercial/Industrial) 0 to <1m, Sand Soils for Vapour Intrusion
  - #10 ASC NEPM (2013) HSL-D (Commercial/Industrial) +4 m, Sand Soils for Vapour Intrusion
  - #11 ASC NEPM (2013) Health Investigation Level (HIL-D) Commercial/Industrial















Table 4k. AEC - MK Soil Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	Chlorinated Hydrocarbons																										VOCs											
	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,1-dichloroethene	1,1-dichloropropene	1,2,3-trichloropropene	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	2,2-dichloropropane	Bromodichloromethane	Bromoform	Carbon tetrachloride	Chlorodibromomethane	Chloroethane	Chloroform	Chloromethane	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Dibromomethane	Hexachlorobutadiene	Trichloroethene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Vinyl chloride	cis-1,4-Dichloro-2-butene	Pentachloroethane	trans-1,4-Dichloro-2-butene	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	Isopropylbenzene	n-butylbenzene				
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg			
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	0.5	5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND																																						
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND																																						
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND																																						
Human Health - HSL-D - Vapour Intrusion + 4m SAND																																						
Human Health - Intrusive - Vapour Intrusion 0-<2m																																						
Human Health - Intrusive - Vapour Intrusion 2-<4m																																						
Human Health - Intrusive - Vapour Intrusion + 4m																																						
Human Health - Intrusive - Direct Contact																																						
Human Health - Direct Contact - HIL-D																																						
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)																																						
NEPM (2013) ESL - Commercial & Industrial (Coarse)																																						
NEPM (2013) ESL - Commercial & Industrial (Fine)																																						

Location Code	Field ID	Sample Code	Sampled Date	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,1-dichloroethene	1,1-dichloropropene	1,2,3-trichloropropene	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	2,2-dichloropropane	Bromodichloromethane	Bromoform	Carbon tetrachloride	Chlorodibromomethane	Chloroethane	Chloroform	Chloromethane	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Dibromomethane	Hexachlorobutadiene	Trichloroethene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Vinyl chloride	cis-1,4-Dichloro-2-butene	Pentachloroethane	trans-1,4-Dichloro-2-butene	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	Isopropylbenzene	n-butylbenzene		
MK_SB28	MK_SB28_0.2	ESI323031012	17-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MK_SB30	MK_SB30_0.5	ESI324716004	12-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MK_SB30	MK_SB30_2.7	ESI325473010	20-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MK_SB31	MK-SB31-0.2	ESI322662009	15-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MK_SB32	MK-SB32-0.1	ESI322662008	15-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MK_SB33	MK_SB33_1.5	ESI324470013	06-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MK_SB33	MK_SB33_1.0	ESI323031007	17-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MK_SB34	MK_SB34_2.0	ESI324470010	06-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MK_SB34	MK_SB34_0.8	ESI323031009	17-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MK_SB35	MK_SB35_1.0	ESI323031011	17-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MK_SB35	MK_SB35_3.0	ESI324470008	06-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
MK_SB36	MK-SB36-0.1	ESI322662010	15-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MK_SB37	MK-SB37-1.0	ESI322662012	15-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MK_SB38	MK_SB38_3.8	ESI324470021	07-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
MK_SB38	MK-SB38-0.5	ESI322662013	15-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
MK_SB39	MK-SB39-1.0	ESI322662007	15-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB39	MK-SB39-5.0	ESI322662019	16-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
MK_SB40	MK_SB40_2.0	ESI324470019	07-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
MK_SB40	MK-SB40-0.7	ESI322662006	15-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB42	MK_SB42_0.4	ESI324716002	11-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB42	MK_SB42_3.5	ESI325783001	21-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB43	MK_SB43_0.2	ESI324233005	06-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB43	MK_SB43_1.6	ESI325473008	20-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB44	MK_SB44_0.2	ESI324233006	06-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB44	MK_SB44_2.5	ESI325473007	20-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB45	MK_SB45_0.05	ESI325970007	27-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB46	MK_SB46_1.0	ESI323862012	29-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB46	MK_SB46_2.0	ESI323862033	31-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB47	MK_SB47_0.5	ESI323862011	29-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB47	MK_SB47_3.0	ESI323862032	31-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB49	MK_SB49_0.5	ESI324473004	07-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
MK_SB50	MK-SB50-0.1	ESI32																																					





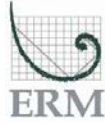


Table 4k. AEC - MK Soil Chemistry Summary  
Mt Piper Power Station - Stege 2 ESA  
Project Symphony - 0207423

	Chlorinated Hydrocarbons																										VOCs										
	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,1-dichloroethene	1,1-dichloropropene	1,1,2-trichloropropene	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	2,2-dichloropropane	Bromodichloromethane	Bromoform	Carbon tetrachloride	Chlorodibromomethane	Chloroethane	Chloroform	Chloromethane	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Dibromomethane	Hexachlorobutadiene	Trichloroethene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Vinyl chloride	cis-1,4-Dichloro-2-butene	Pentachloroethane	trans-1,4-Dichloro-2-butene	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	Isopropylbenzene	n-butylbenzene			
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	0.5	5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND																																					
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND																																					
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND																																					
Human Health - HSL-D - Vapour Intrusion + 4m SAND																																					
Human Health - Intrusive - Vapour Intrusion 0-<2m																																					
Human Health - Intrusive - Vapour Intrusion 2-<4m																																					
Human Health - Intrusive - Vapour Intrusion + 4m																																					
Human Health - Intrusive - Direct Contact																																					
Human Health - Direct Contact - HIL-D																																					
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)																																					
NEPM (2013) ESL - Commercial & Industrial (Coarse)																																					
NEPM (2013) ESL - Commercial & Industrial (Fine)																																					

Location Code	Field ID	Sample Code	Sampled Date	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,1-dichloroethene	1,1-dichloropropene	1,1,2-trichloropropene	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	2,2-dichloropropane	Bromodichloromethane	Bromoform	Carbon tetrachloride	Chlorodibromomethane	Chloroethane	Chloroform	Chloromethane	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Dibromomethane	Hexachlorobutadiene	Trichloroethene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Vinyl chloride	cis-1,4-Dichloro-2-butene	Pentachloroethane	trans-1,4-Dichloro-2-butene	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	Isopropylbenzene	n-butylbenzene	
MK_SB82	MK_SB82_3.9	ESI324470001	06-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB82	MK_SB82_0.2	ESI323862014	29-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB84	MK_SB84_0.2	ESI324233003	06-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB86	MK_SB86_1.5	ESI324470004	06-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB86	MK_SB86_0.5	ESI323862016	29-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB87	MK_SB87_1.0	ESI323862004	28-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	1	1.3	<0.5	<0.5
MK_SB87	MK_SB87_3.0	ESI323862028	31-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Statistical Summary	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,1-dichloroethene	1,1-dichloropropene	1,1,2-trichloropropene	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	2,2-dichloropropane	Bromodichloromethane	Bromoform	Carbon tetrachloride	Chlorodibromomethane	Chloroethane	Chloroform	Chloromethane	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Dibromomethane	Hexachlorobutadiene	Trichloroethene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Vinyl chloride	cis-1,4-Dichloro-2-butene	Pentachloroethane	trans-1,4-Dichloro-2-butene	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	Isopropylbenzene	n-butylbenzene		
Number of Results	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	
Maximum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1	1.3	<0.5	<0.5
Average Concentration	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.5	0.25	2.5	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Median Concentration	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.5	0.25	2.5	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Standard Deviation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

- Comments
- #1 NEPC (2010) Ecological Investigation Level Calculator
  - #2 CRC Care (2011) Intrusive Maintenance Workers, 2 to <4m, Sand Soils for Vapour Int
  - #3 CRC Care (2011) Intrusive Maintenance Workers, 0 to <2m, Sand Soils for Vapour Int
  - #4 CRC Care (2011) Intrusive Maintenance Workers, +4 m, Sand Soils for Vapour Intrus
  - #5 CRC Care (2011) Intrusive Maintenance Workers for Direct Contact
  - #6 ASC NEPM (2013) HSL-D (Commercial/Industrial) for Direct Contact
  - #7 ASC NEPM (2013) HSL-D (Commercial/Industrial) 2 to <4m, Sand Soils for Vapour
  - #8 ASC NEPM (2013) HSL-D (Commercial/Industrial) 1 to <2m, Sand Soils for Vapour
  - #9 ASC NEPM (2013) HSL-D (Commercial/Industrial) 0 to <1m, Sand Soils for Vapour
  - #10 ASC NEPM (2013) HSL-D (Commercial/Industrial) +4 m, Sand Soils for Vapour Int
  - #11 ASC NEPM (2013) Health Investigation Level (HIL-D) Commercial/Industrial



Table 4k. AEC - MK Soil Chemistry Summary  
Mt Piper Power Station - Stege 2 ESA  
Project Symphony - 0207423

	MAH					Halogenated Benzenes								Halogenated Hydrocarbons					Solvents				Polychlorinated Biphenyls		
	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	Styrene	tert-butylbenzene	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	2-chlorotoluene	4-chlorotoluene	Bromobenzene	Chlorobenzene	1,2-dibromoethane	Bromomethane	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane	Methyl Ethyl Ketone	2-hexanone (MBK)	4-Methyl-2-pentanone	Carbon disulfide	Vinyl acetate	PCBs (Sum of total)
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	5	0.5	5	5	5	5	5	0.5	5	0.1
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND																									
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND																									
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND																									
Human Health - HSL-D - Vapour Intrusion + 4m SAND																									
Human Health - Intrusive - Vapour Intrusion 0-<2m																									
Human Health - Intrusive - Vapour Intrusion 2-<4m																									
Human Health - Intrusive - Vapour Intrusion + 4m																									
Human Health - Intrusive - Direct Contact																									
Human Health - Direct Contact - HIL-D																									7#11
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)																									
NEPM (2013) ESL - Commercial & Industrial (Coarse)																									
NEPM (2013) ESL - Commercial & Industrial (Fine)																									

Location Code	Field ID	Sample Code	Sampled Date	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	Styrene	tert-butylbenzene	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	2-chlorotoluene	4-chlorotoluene	Bromobenzene	Chlorobenzene	1,2-dibromoethane	Bromomethane	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane	Methyl Ethyl Ketone	2-hexanone (MBK)	4-Methyl-2-pentanone	Carbon disulfide	Vinyl acetate	PCBs (Sum of total)
MK_SB01	MK_SB01_0.2	ESI324472009	08-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB02	MK_SB02_0.5	ESI323862009	28-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB02	MK_SB02_1.5	ESI323862034	31-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB03	MK_SB03_0.5	ESI324472002	08-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB04	MK_SB04_0.2	ESI323862002	28-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB04	MK_SB04_2.8	ESI323862025	30-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
MK_SB05	MK_SB05_0.5	ESI323862006	28-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB06	MK_SB06_0.2	ESI323862008	28-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB08	MK_SB08_0.2	ESI324472006	08-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB09	MK_SB09_0.1	ESI322434005	10-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB09	MK_SB09_1.15	ESI323862026	30-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB10	MK_SB10_1.2	ESI322434009	11-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB10	MK_SB10_1.5	ESI322662031	14-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB11	MK_SB11_1.0	ESI323862001	28-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB12	MK_SB12_0.2	ESI323031003	17-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB13	MK_SB13_1.0	ESI323031001	17-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
MK_SB13	MK_SB13_1.6	ESI324470034	08-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB14	MK_SB14_1.0	ESI322434007	10-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB15	MK_SB15_0.1	ESI322434003	10-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB16	MK_SB16_0.5	ESI322434004	10-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB16	MK_SB16_1.5	ESI322662003	14-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
MK_SB17	MK_SB17_1.5	ESI323862024	30-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB18	MK_SB18_0.1	ESI323031014	18-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB19	MK_SB19_0.1	ESI323031015	18-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB20	MK_SB20_0.1	ESI323031016	18-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB22	MK_SB22_1.5	ESI324470015	06-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
MK_SB22	MK_SB22_0.5	ESI323031013	17-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB24	MK_SB24_0.4	ESI324716005	12-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB24	MK_SB24_2.0	ESI325473009	20-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB25	MK_SB25_0.2	ESI323031017	18-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB26	MK_SB26_0.2	ESI323031018	18-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB27	MK_SB27_0.2	ESI323031004	17-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB28	MK_SB28_2.0	ESI324470006	06-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1



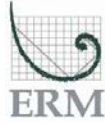
Table 4k. AEC - MK Soil Chemistry Summary  
Mt Piper Power Station - Stege 2 ESA  
Project Symphony - 0207423

	MAH					Halogenated Benzenes								Halogenated Hydrocarbons					Solvents				Polychlorinated Biphenyls			
	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	Styrene	tert-butylbenzene	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	2-chlorotoluene	4-chlorotoluene	Bromobenzene	Chlorobenzene	1,2-dibromoethane	Bromomethane	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane	Methyl Ethyl Ketone	2-hexanone (MBK)	4-Methyl-2-pentanone	Carbon disulfide	Vinyl acetate	PCBs (Sum of total)	
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	5	0.5	5	5	5	5	0.5	5		0.1	
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND																										
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND																										
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND																										
Human Health - HSL-D - Vapour Intrusion + 4m SAND																										
Human Health - Intrusive - Vapour Intrusion 0-<2m																										
Human Health - Intrusive - Vapour Intrusion 2-<4m																										
Human Health - Intrusive - Vapour Intrusion + 4m																										
Human Health - Intrusive - Direct Contact																										
Human Health - Direct Contact - HIL-D																										7#11
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)																										
NEPM (2013) ESL - Commercial & Industrial (Coarse)																										
NEPM (2013) ESL - Commercial & Industrial (Fine)																										

Location Code	Field ID	Sample Code	Sampled Date	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	Styrene	tert-butylbenzene	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	2-chlorotoluene	4-chlorotoluene	Bromobenzene	Chlorobenzene	1,2-dibromoethane	Bromomethane	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane	Methyl Ethyl Ketone	2-hexanone (MBK)	4-Methyl-2-pentanone	Carbon disulfide	Vinyl acetate	PCBs (Sum of total)	
MK_SB28	MK_SB28_0.2	ES1323031012	17-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB30	MK_SB30_0.5	ES1324716004	12-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB30	MK_SB30_2.7	ES1325473010	20-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB31	MK_SB31-0.2	ES1322662009	15-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB32	MK_SB32-0.1	ES1322662008	15-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB33	MK_SB33_1.5	ES1324470013	06-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB33	MK_SB33_1.0	ES1323031007	17-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB34	MK_SB34_2.0	ES1324470010	06-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB34	MK_SB34_0.8	ES1323031009	17-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB35	MK_SB35_1.0	ES1323031011	17-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB35	MK_SB35_3.0	ES1324470008	06-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<0.5	<5	<5	<5	<0.5	<5	<0.5	<0.1
MK_SB36	MK_SB36-0.1	ES1322662010	15-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB37	MK_SB37-1.0	ES1322662012	15-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB38	MK_SB38_3.8	ES1324470021	07-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<0.5	<5	<5	<5	<0.5	<5	<0.5	<0.1
MK_SB38	MK_SB38-0.5	ES1322662013	15-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<0.5	<5	<5	<5	<0.5	<5	<0.5	<0.1
MK_SB39	MK_SB39-1.0	ES1322662007	15-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB39	MK_SB39-5.0	ES1322662019	16-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<0.5	<5	<5	<5	<0.5	<5	<0.5	<0.1
MK_SB40	MK_SB40_2.0	ES1324470019	07-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<0.5	<5	<5	<5	<0.5	<5	<0.5	<0.1
MK_SB40	MK_SB40-0.7	ES1322662006	15-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB42	MK_SB42_0.4	ES1324716002	11-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB42	MK_SB42_3.5	ES1325783001	21-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB43	MK_SB43_0.2	ES1324233005	06-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB43	MK_SB43_1.6	ES1325473008	20-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB44	MK_SB44_0.2	ES1324233006	06-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB44	MK_SB44_2.5	ES1325473007	20-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB45	MK_SB45_0.05	ES1325970007	27-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB46	MK_SB46_1.0	ES1323862012	29-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB46	MK_SB46_2.0	ES1323862033	31-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB47	MK_SB47_0.5	ES1323862011	29-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB47	MK_SB47_3.0	ES1323862032	31-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB49	MK_SB49_0.5	ES1324473004	07-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<0.5	<5	<5	<5	<0.5	<5	<0.5	<0.1
MK_SB50	MK_SB50-0.1	ES1322662002	14-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<0.5	<5	<5	<5	<0.5	<5	<0.5	<0.1
MK_SB51	MK_SB51_1.0	ES1323862020	30-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<0.5	<5	<5	<5	<0.5	<5	<0.5	<0.1







	MAH					Halogenated Benzenes								Halogenated Hydrocarbons					Solvents					Polychlorinated Biphenyls	
	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	Styrene	tert-butylbenzene	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	2-chlorotoluene	4-chlorotoluene	Bromobenzene	Chlorobenzene	1,2-dibromoethane	Bromomethane	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane	Methyl Ethyl Ketone	2-hexanone (MBK)	4-Methyl-2-pentanone	Carbon disulfide	Vinyl acetate	PCBs (Sum of total)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	5	0.5	5	5	5	5	5	0.5	5	0.1
Human Health - HSL-D - Vapour Intrusion 0-<1m SAND																									
Human Health - HSL-D - Vapour Intrusion 1-<2m SAND																									
Human Health - HSL-D - Vapour Intrusion 2-<4m SAND																									
Human Health - HSL-D - Vapour Intrusion + 4m SAND																									
Human Health - Intrusive - Vapour Intrusion 0-<2m																									
Human Health - Intrusive - Vapour Intrusion 2-<4m																									
Human Health - Intrusive - Vapour Intrusion + 4m																									
Human Health - Intrusive - Direct Contact																									
Human Health - Direct Contact - HIL-D																									7#11
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)																									
NEPM (2013) ESL - Commercial & Industrial (Coarse)																									
NEPM (2013) ESL - Commercial & Industrial (Fine)																									

Location Code	Field ID	Sample Code	Sampled Date	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	Styrene	tert-butylbenzene	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	2-chlorotoluene	4-chlorotoluene	Bromobenzene	Chlorobenzene	1,2-dibromoethane	Bromomethane	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane	Methyl Ethyl Ketone	2-hexanone (MBK)	4-Methyl-2-pentanone	Carbon disulfide	Vinyl acetate	PCBs (Sum of total)	
MK_SB82	MK_SB82_3.9	ESI324470001	06-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB82	MK_SB82_0.2	ESI323862014	29-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB84	MK_SB84_0.2	ESI324233003	06-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB86	MK_SB86_1.5	ESI324470004	06-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB86	MK_SB86_0.5	ESI323862016	29-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK_SB87	MK_SB87_1.0	ESI323862004	28-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<0.5	<5	<5	<5	<0.5	<5	<0.1	
MK_SB87	MK_SB87_3.0	ESI323862028	31-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<0.5	<5	<5	<5	<0.5	<5	<0.1	

Statistical Summary																												
Number of Results	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<5	<0.5	<5	<0.1
Maximum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<5	<0.5	<5	<0.1
Average Concentration	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.5	2.5	0.25	2.5	2.5	2.5	2.5	2.5	0.25	2.5	0.05
Median Concentration	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.5	2.5	0.25	2.5	2.5	2.5	2.5	2.5	0.25	2.5	0.05
Standard Deviation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

- Comments**
- #1 NEPC (2010) Ecological Investigation Level Calculator
  - #2 CRC Care (2011) Intrusive Maintenance Workers, 2 to <4m, Sand Soils for Vapour Int
  - #3 CRC Care (2011) Intrusive Maintenance Workers, 0 to <2m, Sand Soils for Vapour Int
  - #4 CRC Care (2011) Intrusive Maintenance Workers, +4 m, Sand Soils for Vapour Intrus
  - #5 CRC Care (2011) Intrusive Maintenance Workers for Direct Contact
  - #6 ASC NEPM (2013) HSL-D (Commercial/Industrial) for Direct Contact
  - #7 ASC NEPM (2013) HSL-D (Commercial/Industrial) 2 to <4m, Sand Soils for Vapour
  - #8 ASC NEPM (2013) HSL-D (Commercial/Industrial) 1 to <2m, Sand Soils for Vapour
  - #9 ASC NEPM (2013) HSL-D (Commercial/Industrial) 0 to <1m, Sand Soils for Vapour
  - #10 ASC NEPM (2013) HSL-D (Commercial/Industrial) +4 m, Sand Soils for Vapour Int
  - #11 ASC NEPM (2013) Health Investigation Level (HIL-D) Commercial/Industrial



Table 4i. AEC - ML Soil Chemistry Summary  
Mt Piper Power Station -Stage 2 ESA  
Project Symphony - 0207423

	TRH											BTEX							Metals										
	TRH > C6-C9 Fraction	TRH > C10-C14 Fraction	TRH > C15-C28 Fraction	TRH > C29-C36 Fraction	TRH > C10-C36 Fraction	TRH > C6-C10 Fraction	TRH > C6-C10 less BTEX (F1)	TRH > C10-C16 Fraction	TRH > C10-C16 less Naphthalene (F2)	TRH > C16-C34 Fraction	TRH > C34-C40 Fraction	TRH > C10-C40 Fraction	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Total BTEX	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Selenium	Zinc	Acenaphthene
EQL	10	50	100	100	50	10	10	50	50	100	100	50	0.2	0.5	0.5	0.5	0.5	0.5	0.2	5	1	2	5	5	0.1	2	5	5	0.5
Human Health - Intrusive - Direct Contact							82000 <sup>#5</sup>	62000 <sup>#5</sup>	85000 <sup>#5</sup>	120000 <sup>#5</sup>		1100 <sup>#5</sup>	120000 <sup>#5</sup>	85000 <sup>#5</sup>			130000 <sup>#5</sup>		3000 <sup>#11</sup>	900 <sup>#11</sup>		240000 <sup>#11</sup>	1500 <sup>#11</sup>	730 <sup>#11</sup>	6000 <sup>#11</sup>	10000 <sup>#11</sup>	400000 <sup>#11</sup>		
Human Health - Direct Contact - HIL-D							26000 <sup>#6</sup>	20000 <sup>#6</sup>	27000 <sup>#6</sup>	38000 <sup>#6</sup>		430 <sup>#6</sup>	99000 <sup>#6</sup>	27000 <sup>#6</sup>			81000 <sup>#6</sup>		160 <sup>#1</sup>	900 <sup>#11</sup>	870 <sup>#1</sup>	130 <sup>#1</sup>	1800 <sup>#1</sup>						
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)																													
NEPM (2013) ESL - Commercial & Industrial (Coarse)							215	170	1700	3300		75	135	165			180												
NEPM (2013) ESL - Commercial & Industrial (Fine)										2500	6600	95	135	185			95												

Location Code	Field ID	Sample Code	Sampled Date	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	93	<1	9	22	25	<0.1	15	<5	59	<0.5
ML_MW02	ML_MW02_0.2	ES1323858017	01-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	93	<1	9	22	25	<0.1	15	<5	59	<0.5
ML_MW03	ML_MW03_1.7	ES1323859005	29-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	-	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	11	<1	10	18	27	<0.1	26	<5	46	<0.5
ML_MW03	ML_MW03-0.2	ES1322662022	16-Oct-13	<10	<50	100	<100	100	<10	<10	<50	<50	120	<100	120	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	9	<1	5	16	18	<0.1	30	<5	58	<0.5
ML_MW05	ML_MW05_2.9	ES1323858002	31-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	7	12	20	<0.1	10	<5	31	<0.5
ML_MW05	ML_MW05-0.5	ES1322662024	16-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	10	1	13	11	20	<0.1	12	<5	57	<0.5
ML_MW07	ML_MW07_2.0	ES1325473003	20-Nov-13	10	<50	<100	<100	<50	12	11	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	0.8	0.8 - 1.05	0.8	12	<1	9	29	26	0.1	60	<5	98	<0.5
ML_MW07	ML_MW07-0.2	ES1324472010	08-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	5	<1	6	14	16	<0.1	12	<5	23	<0.5
ML_MW08	ML_MW08_0.5	ES1322146004	09-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	21	<1	13	36	28	<0.1	75	<5	106	<0.5
ML_MW08	ML_MW08_7.0	ES1323858010	31-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	7	<1	15	14	17	<0.1	20	<5	40	<0.5
ML_MW10	ML_MW10_1.6	ES1323859002	29-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	-	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	5	<1	10	10	15	<0.1	9	<5	38	<0.5
ML_MW10	ML_MW10-0.2	ES1322662030	16-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	5	<5	7	<0.1	2	<5	34	<0.5
ML_MW12	ML_MW12_0.1	ES1322662029	16-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	9	<1	5	12	15	<0.1	17	<5	38	<0.5
ML_MW14	ML_MW14_0.1	ES1326246001	28-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	8	11	10	<0.1	18	<5	38	<0.5
ML_MW15	ML_MW15_3.0	ES1323862010	28-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	5	<1	14	10	13	<0.1	10	<5	70	<0.5
ML_MW15	ML_MW15-0.1	ES1322662026	16-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	6	<1	7	8	16	<0.1	14	<5	32	<0.5
ML_MW17	ML_MW17_0.2	ES1322435001	14-Oct-13	<10	<50	110	<100	110	<10	<10	<50	<50	130	<100	130	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	18	<1	13	27	23	<0.1	47	<5	89	<0.5
ML_MW18	ML_MW18-0.1	ES1322662023	16-Oct-13	<10	80	630	180	890	<10	<10	150	150	690	<100	840	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	6	<1	3	13	20	<0.1	12	<5	35	<0.5
ML_MW19	ML_MW19_0.1	ES1322435005	14-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	10	<1	12	10	20	<0.1	12	<5	30	<0.5
ML_MW20	ML_MW20_0.1	ES1322435003	14-Oct-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	110	<100	110	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	5	<1	9	37	19	<0.1	33	<5	81	<0.5
ML_MW21	ML_MW21_0.1	ES1322435004	14-Oct-13	<10	80	630	180	890	<10	<10	140	140	690	<100	830	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	3	11	18	<0.1	11	<5	115	<0.5
ML_MW22	ML_SB22_0.05	ES1325970002	27-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	7	<1	12	9	24	<0.1	10	<5	66	<0.5
ML_MW23	ML_MW23_0.1	ES1322435002	14-Oct-13	<10	80	560	140	780	<10	<10	130	130	610	<100	740	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	4	10	15	<0.1	23	<5	31	<0.5
ML_MW24	ML_MW24_0.2	ES1322662021	16-Oct-13	<10	<50	140	<100	140	<10	<10	<50	<50	160	<100	160	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	11	<1	5	16	18	<0.1	20	<5	50	<0.5
ML_SB25	ML_SB25_0.05	ES1324470026	06-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	8	<1	8	18	24	<0.1	27	<5	58	<0.5
ML_SB26	ML_SB26_0.05	ES1324470025	06-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	7	<1	4	8	13	<0.1	17	<5	43	<0.5
ML_SB27	ML_SB27_0.05	ES1324470024	06-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	<2	<5	<5	<0.1	4	<5	16	<0.5
ML_SB28	ML_SB28_0.05	ES1324470029	06-Nov-13	<10	60	550	180	790	<10	<10	110	110	630	<100	740	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	11	<1	8	14	24	<0.1	9	<5	80	<0.5
ML_SB29	ML_SB29_0.1	ES1325970004	27-Nov-13	<10	<50	240	<100	240	<10	<10	60	60	260	<100	320	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	8	<1	4	18	24	<0.1	19	<5	62	<0.5
ML_SB30	ML_SB30_0.1	ES1325900009	26-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	14	<1	25	28	40	0.1	14	<5	10	<0.5
ML_SB31	ML_SB31_0.1	ES1325970003	27-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	7	<1	7	13	17	<0.1	22	<5	64	<0.5
ML_SB32	ML_SB32_0.05	ES1325900008	26-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	8	<1	5	13	16	<0.1	13	<5	47	<0.5
ML_SB34	ML_SB34_0.05	ES1325970001	27-Nov-13	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	15	<1	9	17	21	<0.1	40	<5	81	<0.5
ML_SB35	ML_SB35_0.1	ES1324470030	06-Nov-13	<10	<50	110	<100	110	<10	<10	&																					



Table 4I. AEC - ML Soil Chemistry Summary  
Mt Piper Power Station -Stage 2 ESA  
Project Symphony - 0207423

	TRH											BTEX							Metals										
	TRH >C6-C9 Fraction	TRH >C10-C14 Fraction	TRH >C15-C28 Fraction	TRH >C29-C36 Fraction	TRH >C10-C36 Fraction	TRH >C6-C10 Fraction	TRH >C6-C10 less BTEX (F1)	TRH >C10-C16 Fraction	TRH >C10-C16 less Naphthalene (F2)	TRH >C16-C34 Fraction	TRH >C34-C40 Fraction	TRH >C10-C40 Fraction	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Total BTEX	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Selenium	Zinc	Acenaphthene
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	10	50	100	100	50	10	10	50	50	100	100	50	0.2	0.5	0.5	0.5	0.5	0.5	0.2	5	1	2	5	5	0.1	2	5	5	0.5
Human Health - Intrusive - Direct Contact							82000 <sup>#5</sup>	62000 <sup>#5</sup>	85000 <sup>#5</sup>	120000 <sup>#5</sup>		1100 <sup>#5</sup>	120000 <sup>#5</sup>	85000 <sup>#5</sup>			130000 <sup>#5</sup>												
Human Health - Direct Contact - HIL-D							26000 <sup>#6</sup>	20000 <sup>#6</sup>	27000 <sup>#6</sup>	38000 <sup>#6</sup>		430 <sup>#6</sup>	99000 <sup>#6</sup>	27000 <sup>#6</sup>			81000 <sup>#6</sup>			3000 <sup>#11</sup>	900 <sup>#11</sup>		240000 <sup>#11</sup>	1500 <sup>#11</sup>	730 <sup>#11</sup>	6000 <sup>#11</sup>	10000 <sup>#11</sup>	400000 <sup>#11</sup>	
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)																				160 <sup>#1</sup>		870 <sup>#1</sup>	130 <sup>#1</sup>	1800 <sup>#1</sup>		160 <sup>#1</sup>		280 <sup>#1</sup>	
NEPM (2013) ESL - Commercial & Industrial (Coarse)							215	170	1700	3300		75	135	165			180												
NEPM (2013) ESL - Commercial & Industrial (Fine)										2500	6600		95	135	185		95												

Location Code	Field ID	Sample Code	Sampled Date																												
Number of Results	38	38	38	38	38	38	38	38	38	36	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	
Number of Detects	1	5	11	5	11	1	1	7	7	12	0	12	0	0	0	1	1	1	1	30	1	37	36	37	2	38	0	38	0		
Minimum Concentration	<10	<50	<100	<100	<50	<10	<50	<50	<50	<100	<50	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<5	<1	<2	<5	<5	<0.1	2	<5	10	<0.5		
Maximum Concentration	10	80	630	180	890	12	11	150	150	690	<100	840	<0.2	<0.5	<0.5	<0.5	0.8	1.05	0.8	93	1	144	840	65	0.1	666	<5	641	<0.5		
Average Concentration	5.1	31	135	64	148	5.2	5.2	40	41	148	50	150	0.1	0.25	0.25	0.25	0.26	0.27	0.12	11	0.51	12	37	21	0.053	41	2.5	77	0.25		
Median Concentration	5	25	50	50	25	5	5	25	25	50	50	25	0.1	0.25	0.25	0.25	0.25	0.25	0.1	7.5	0.5	8	14	20	0.05	17	2.5	57.5	0.25		
Standard Deviation	0.81	16	177	39	262	1.1	0.97	35	36	197	0	249	0	0	0	0	0.089	0.11	0.11	15	0.081	22	134	10	0.011	106	0	104	0		
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0		
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0		

Comments

- #1 NEPC (2010) Ecological Investigation Level Calculator
- #2 CRC Care (2011) Intrusive Maintenance Workers, 2 to <4m, Sand Soils for Vapour Intrusion
- #3 CRC Care (2011) Intrusive Maintenance Workers, 0 to <2m, Sand Soils for Vapour Intrusion
- #4 CRC Care (2011) Intrusive Maintenance Workers, +4 m, Sand Soils for Vapour Intrusion
- #5 CRC Care (2011) Intrusive Maintenance Workers for Direct Contact
- #6 ASC NEPM (2013) HSL-D (Commercial/Industrial) for Direct Contact
- #7 ASC NEPM (2013) HSL-D (Commercial/Industrial) 2 to <4m, Sand Soils for Vapour Intrusion
- #8 ASC NEPM (2013) HSL-D (Commercial/Industrial) 1 to <2m, Sand Soils for Vapour Intrusion
- #9 ASC NEPM (2013) HSL-D (Commercial/Industrial) 0 to <1m, Sand Soils for Vapour Intrusion
- #10 ASC NEPM (2013) HSL-D (Commercial/Industrial) +4 m, Sand Soils for Vapour Intrusion
- #11 ASC NEPM (2013) Health Investigation Level (HIL-D) Commercial/Industrial











Table 4I. AEC - ML Soil Chemistry Summary  
Mt Piper Power Station -Stage 2 ESA  
Project Symphony - 0207423

	Chlorinated Hydrocarbons																											VOCs										
	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,1-dichloroethene	1,1-dichloropropene	1,1,2-trichloropropene	1,1-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	2,2-dichloropropane	Bromodichloromethane	Bromoform	Carbon tetrachloride	Chlorodibromomethane	Chloroethane	Chloroform	Chloromethane	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Dibromomethane	Hexachlorobutadiene	Trichloroethene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Vinyl chloride	cis-1,4-Dichloro-2-butene	Pentachloroethane	trans-1,4-Dichloro-2-butene	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	Isopropylbenzene	n-butylbenzene				
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	0.5	5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		
Human Health - Intrusive - Direct Contact																																						
Human Health - Direct Contact - HIL-D																																						
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)																																						
NEPM (2013) ESL - Commercial & Industrial (Coarse)																																						
NEPM (2013) ESL - Commercial & Industrial (Fine)																																						

Location Code	Field ID	Sample Code	Sampled Date																																			
Number of Results				21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	
Number of Detects				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Maximum Concentration				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Average Concentration				0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	
Median Concentration				0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Standard Deviation				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments

- #1 NEPC (2010) Ecological Investigation Level Calculator
- #2 CRC Care (2011) Intrusive Maintenance Workers, 2 to <4m, Sand Soils for Vapour Int
- #3 CRC Care (2011) Intrusive Maintenance Workers, 0 to <2m, Sand Soils for Vapour Int
- #4 CRC Care (2011) Intrusive Maintenance Workers, +4 m, Sand Soils for Vapour Intrus
- #5 CRC Care (2011) Intrusive Maintenance Workers for Direct Contact
- #6 ASC NEPM (2013) HSL-D (Commercial/Industrial) for Direct Contact
- #7 ASC NEPM (2013) HSL-D (Commercial/Industrial) 2 to <4m, Sand Soils for Vapour I
- #8 ASC NEPM (2013) HSL-D (Commercial/Industrial) 1 to <2m, Sand Soils for Vapour I
- #9 ASC NEPM (2013) HSL-D (Commercial/Industrial) 0 to <1m, Sand Soils for Vapour I
- #10 ASC NEPM (2013) HSL-D (Commercial/Industrial) +4 m, Sand Soils for Vapour Int
- #11 ASC NEPM (2013) Health Investigation Level (HIL-D) Commercial/Industrial



Table 4i. AEC - ML Soil Chemistry Summary  
Mt Piper Power Station -Stage 2 ESA  
Project Symphony - 0207423

	MAH					Halogenated Benzenes								Halogenated Hydrocarbons					Solvents					Polychlorinated Biphenyls		
	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	Styrene	tert-butylbenzene	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	2-chlorotoluene	4-chlorotoluene	Bromobenzene	Chlorobenzene	1,2-dibromoethane	Bromomethane	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane	Methyl Ethyl Ketone	2-hexanone (MBK)	4-Methyl-2-pentanone	Carbon disulfide	Vinyl acetate	PCBs (Sum of total)	
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	5	0.5	5	5	5	5	0.5	5		0.1	
Human Health - Intrusive - Direct Contact																										
Human Health - Direct Contact - HIL-D																										7 <sup>#11</sup>
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)																										
NEPM (2013) ESL - Commercial & Industrial (Coarse)																										
NEPM (2013) ESL - Commercial & Industrial (Fine)																										

Location Code	Field ID	Sample Code	Sampled Date	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	Styrene	tert-butylbenzene	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	2-chlorotoluene	4-chlorotoluene	Bromobenzene	Chlorobenzene	1,2-dibromoethane	Bromomethane	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane	Methyl Ethyl Ketone	2-hexanone (MBK)	4-Methyl-2-pentanone	Carbon disulfide	Vinyl acetate	PCBs (Sum of total)
ML_MW02	ML_MW02_0.2	ES1323858017	01-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
ML_MW03	ML_MW03_1.7	ES1323859005	29-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
ML_MW03	ML_MW03-0.2	ES1322662022	16-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
ML_MW05	ML_MW05_2.9	ES1323858002	31-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
ML_MW05	ML_MW05-0.5	ES1322662024	16-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
ML_MW07	ML_MW07_2.0	ES1325473003	20-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ML_MW07	ML_MW07-0.2	ES1324472010	08-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
ML_MW08	ML_MW08_0.5	ES1322146004	09-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ML_MW08	ML_MW08_7.0	ES1323858010	31-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ML_MW10	ML_MW10_1.6	ES1323859002	29-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
ML_MW10	ML_MW10-0.2	ES1322662030	16-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
ML_MW12	ML_MW12_0.1	ES1322662029	16-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
ML_MW14	ML_MW14_0.1	ES1326246001	28-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ML_MW15	ML_MW15_3.0	ES1323862010	28-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
ML_MW15	ML_MW15-0.1	ES1322662026	16-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
ML_MW17	ML_MW17_0.2	ES1322435001	14-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ML_MW18	ML_MW18-0.1	ES1322662023	16-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
ML_MW19	ML_MW19_0.1	ES1322435005	14-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ML_MW20	ML_MW20_0.1	ES1322435003	14-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ML_MW21	ML_MW21_0.1	ES1322435004	14-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ML_MW22	ML_SB22_0.05	ES1325970002	27-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ML_MW23	ML_MW23_0.1	ES1322435002	14-Oct-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ML_MW24	ML_MW24_0.2	ES1322662021	16-Oct-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	<0.1
ML_SB25	ML_SB25_0.05	ES1324470026	06-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	-
ML_SB26	ML_SB26_0.05	ES1324470025	06-Nov-13	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	-
ML_SB27	ML_SB27_0.05	ES1324470024	06-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	-
ML_SB28	ML_SB28_0.05	ES1324470029	06-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	-
ML_SB29	ML_SB29_0.1	ES1325970004	27-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ML_SB30	ML_SB30_0.1	ES1325900009	26-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ML_SB31	ML_SB31_0.1	ES1325970003	27-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ML_SB32	ML_SB32_0.05	ES1325900008	26-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ML_SB34	ML_SB34_0.05	ES1325970001	27-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ML_SB35	ML_SB35_0.1	ES1324470030	06-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	-
ML_SB36	ML_SB36_0.05	ES1324470027	06-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	-
ML_SB37	ML_SB37_0.05	ES1324470028	06-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	-
ML_SB38	ML_SB38_0.05	ES1324470031	06-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<0.5	<5	-
ML_SB39	ML_SB39_0.1	ES1325900010	26-Nov-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ML_SB40	ML_SB40_0.1	ES1325900007	26-Nov-13	-	-	-	-																					





Table 4I. AEC - ML Soil Chemistry Summary  
Mt Piper Power Station -Stage 2 ESA  
Project Symphony - 0207423

	MAH					Halogenated Benzenes								Halogenated Hydrocarbons					Solvents					Polychlorinated Biphenyls	
	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	Styrene	tert-butylbenzene	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	2-chlorotoluene	4-chlorotoluene	Bromobenzene	Chlorobenzene	1,2-dibromoethane	Bromomethane	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane	Methyl Ethyl Ketone	2-hexanone (MBK)	4-Methyl-2-pentanone	Carbon disulfide	Vinyl acetate	PCBs (Sum of total)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	5	0.5	5	5	5	5	5	0.5	5	0.1
Human Health - Intrusive - Direct Contact																									
Human Health - Direct Contact - HIL-D																									7 <sup>#11</sup>
NEPM (2013) EIL - Mt. Piper Specific Commercial/Industrial (Aged)																									
NEPM (2013) ESL - Commercial & Industrial (Coarse)																									
NEPM (2013) ESL - Commercial & Industrial (Fine)																									

Location Code	Field ID	Sample Code	Sampled Date																						
Number of Results				21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	13
Number of Detects				0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<5	<0.5	<0.1
Maximum Concentration				<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<5	<5	<5	<5	<5	<0.5	<0.5	<0.1
Average Concentration				0.25	0.26	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.5	2.5	0.25	2.5	2.5	2.5	2.5	2.5	0.25	2.5	0.05
Median Concentration				0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.5	2.5	0.25	2.5	2.5	2.5	2.5	2.5	0.25	2.5	0.05
Standard Deviation				0	0.055	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments

- #1 NEPC (2010) Ecological Investigation Level Calculator
- #2 CRC Care (2011) Intrusive Maintenance Workers, 2 to <4m, Sand Soils for Vapour Int
- #3 CRC Care (2011) Intrusive Maintenance Workers, 0 to <2m, Sand Soils for Vapour Int
- #4 CRC Care (2011) Intrusive Maintenance Workers, +4 m, Sand Soils for Vapour Intrus
- #5 CRC Care (2011) Intrusive Maintenance Workers for Direct Contact
- #6 ASC NEPM (2013) HSL-D (Commercial/Industrial) for Direct Contact
- #7 ASC NEPM (2013) HSL-D (Commercial/Industrial) 2 to <4m, Sand Soils for Vapour
- #8 ASC NEPM (2013) HSL-D (Commercial/Industrial) 1 to <2m, Sand Soils for Vapour
- #9 ASC NEPM (2013) HSL-D (Commercial/Industrial) 0 to <1m, Sand Soils for Vapour
- #10 ASC NEPM (2013) HSL-D (Commercial/Industrial) +4 m, Sand Soils for Vapour Int
- #11 ASC NEPM (2013) Health Investigation Level (HIL-D) Commercial/Industrial



Table 4m. AEC - MM Sediment Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	Moisture		PSD													Soil Classification		TRH															
	%	%	% >75µm	% <75 µm	+75µm	+150µm	+300µm	+425µm	+600µm	+1180µm	+2.36mm	+4.75mm	+9.5mm	+19mm	+37.5mm	+75.0mm	Cobbles	Gravel	TRH >C6-C9 Fraction	TRH >C10-C14 Fraction	TRH >C15-C28 Fraction	TRH >C29-C36 Fraction	TRH >C10-C36 Fraction	TRH >C6-C10 Fraction	TRH >C6-C10 less BTEX (F1)	TRH >C10-C16 Fraction	TRH >C10-C16 less Naphthalene (F2)	TRH >C16-C34 Fraction	TRH >C34-C40 Fraction	TRH >C10-C40 Fraction	Benzene	Ethylbenzene	Toluene
EQL	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	10	50	100	100	50	10	10	50	50	100	100	50	0.2	0.5	0.5
ISQG-High																																	
ISQG-Low																							550#4										

Location Code	Field ID	Location	Sampled Date	Moisture	% >75µm	% <75 µm	+75µm	+150µm	+300µm	+425µm	+600µm	+1180µm	+2.36mm	+4.75mm	+9.5mm	+19mm	+37.5mm	+75.0mm	Cobbles	Gravel	TRH >C6-C9 Fraction	TRH >C10-C14 Fraction	TRH >C15-C28 Fraction	TRH >C29-C36 Fraction	TRH >C10-C36 Fraction	TRH >C6-C10 Fraction	TRH >C6-C10 less BTEX (F1)	TRH >C10-C16 Fraction	TRH >C10-C16 less Naphthalene (F2)	TRH >C16-C34 Fraction	TRH >C34-C40 Fraction	TRH >C10-C40 Fraction	Benzene	Ethylbenzene	Toluene
MM_SS18	WL_SS18	Lake Lyell	21-Nov-13	59.8	12	82	18	10	9	9	9	8	6	<1	<1	<1	<1	<1	<1	6	<10	<50	140	110	250	<10	<10	<50	<50	220	<100	220	<0.2	<0.5	<0.5
MM_SS19	WL_SS19	Lake Lyell	21-Nov-13	41.6	6	91	9	4	4	4	3	3	3	2	<1	<1	<1	<1	<1	3	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5
MM_SS20	WL_SS20	Lake Lyell	21-Nov-13	42.2	5	95	5	3	2	2	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<50	100	<100	100	<10	<10	<50	<50	160	<100	160	<0.2	<0.5	<0.5
MM_SS21	WL_SS21	Lake Lyell	21-Nov-13	71.8	84	<1	100	85	75	67	57	34	16	<1	<1	<1	<1	<1	<1	16	<10	<50	280	310	590	<10	<10	50	50	450	260	760	<0.2	<0.5	<0.5
MM_SS39	WL_SS39	Thompsons Creek Dam	22-Nov-13	62.8	12	80	20	12	11	10	10	9	8	8	8	<1	<1	<1	<1	8	<10	<50	180	250	430	<10	<10	<50	<50	310	240	550	<0.2	<0.5	<0.5
MM_SS40	WL_SS40	Thompsons Creek Dam	22-Nov-13	48.3	27	13	87	83	81	78	74	68	60	47	30	<1	<1	<1	<1	60	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5
MM_SS40	WL_SSC	Thompsons Creek Dam	22-Nov-13	28.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5
MM_SS41	WL_SS41	Thompsons Creek Dam	22-Nov-13	32.2	62	24	76	66	63	57	49	33	15	3	<1	<1	<1	<1	<1	15	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5

Statistical Summary

Number of Results	8	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Number of Detects	8	7	6	7	7	7	7	7	6	6	4	2	0	0	0	0	0	0	6	0	0	4	3	4	0	0	1	1	4	2	4	0	0	0	
Minimum Concentration	28.8	5	<1	5	3	2	2	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<50	<100	<100	<50	<10	<10	<50	<50	<100	<100	<50	<0.2	<0.5	<0.5
Maximum Concentration	71.8	84	95	100	85	81	78	74	68	60	47	30	<1	<1	<1	<1	<1	<1	60	<10	<50	280	310	590	<10	<10	50	50	450	260	760	<0.2	<0.5	<0.5	
Average Concentration	48	30	55	45	38	35	32	29	22	16	8.8	5.8	0.5	0.5	0.5	0.5	0.5	0.5	16	5	25	113	115	184	5	5	28	28	168	100	224	0.1	0.25	0.25	
Median Concentration	45.25	12	80	20	12	11	10	10	9	8	2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	8	5	25	75	50	62.5	5	5	25	25	105	50	92.5	0.1	0.25	0.25	
Standard Deviation	15	31	41	41	38	36	33	30	24	20	17	11	0	0	0	0	0	0	20	0	0	84	105	220	0	0	8.8	8.8	150	93	282	0	0	0	
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0

Comments

- #1 dry wt Sn
- #2 dry wt
- #3 ESDAT Combined.



Table 4m. AEC - MM Sediment Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphonny - 0207423

	BTEX				Metals										PAH														
	Total BTEX	Xylene (m & p)	Xylene (o)	Xylene Total	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Selenium	Zinc	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Carcinogenic PAHs (as B(a)P TEQ (half LOR))	Carcinogenic PAHs (as B(a)P TEQ (LOR))	Naphthalene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	
EQL	0.2	0.5	0.5	0.5	5	1	2	5	5	0.1	2	5	5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
ISQG-High					70 <sup>#2</sup>	10 <sup>#2</sup>	370 <sup>#2</sup>	270 <sup>#2</sup>	220 <sup>#2</sup>	1 <sup>#2</sup>	52 <sup>#2</sup>		410 <sup>#2</sup>	0.5 <sup>#2</sup>	0.64 <sup>#2</sup>	1.1 <sup>#2</sup>	1.6 <sup>#2</sup>	1.6 <sup>#2</sup>						2.1 <sup>#2</sup>	2.8 <sup>#2</sup>	0.26 <sup>#2</sup>	5.1 <sup>#2</sup>	0.54 <sup>#2</sup>	
ISQG-Low					20 <sup>#2</sup>	1.5 <sup>#2</sup>	80 <sup>#2</sup>	65 <sup>#2</sup>	50 <sup>#2</sup>	0.15 <sup>#2</sup>	21 <sup>#2</sup>		200 <sup>#2</sup>	0.016 <sup>#2</sup>	0.044 <sup>#2</sup>	0.085 <sup>#2</sup>	0.261 <sup>#2</sup>	0.43 <sup>#2</sup>						0.16 <sup>#2</sup>	0.384 <sup>#2</sup>	0.063 <sup>#2</sup>	0.6 <sup>#2</sup>	0.019 <sup>#2</sup>	

Location Code	Field ID	Location	Sampled Date	Total BTEX	Xylene (m & p)	Xylene (o)	Xylene Total	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Selenium	Zinc	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Carcinogenic PAHs (as B(a)P TEQ (half LOR))	Carcinogenic PAHs (as B(a)P TEQ (LOR))	Naphthalene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	
MM_SS18	WL_SS18	Lake Lyell	21-Nov-13	<0.2	<0.5	<0.5	<0.5 <sup>#3</sup>	<5	<1	12	18	22	<0.1	17	<5	99	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	1	1.9	<0.8	<0.8	<0.8	<0.8
MM_SS19	WL_SS19	Lake Lyell	21-Nov-13	<0.2	<0.5	<0.5	<0.5 <sup>#3</sup>	5	<1	26	30	40	<0.1	19	<5	73	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5
MM_SS20	WL_SS20	Lake Lyell	21-Nov-13	<0.2	<0.5	<0.5	<0.5 <sup>#3</sup>	<5	<1	6	11	13	<0.1	7	<5	25	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5
MM_SS21	WL_SS21	Lake Lyell	21-Nov-13	<0.2	<0.5	<0.5	<0.5 <sup>#3</sup>	13	1	26	148	24	<0.1	46	<5	201	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	1	1.9	<0.8	<0.8	<0.8	<0.8
MM_SS39	WL_SS39	Thompsons Creek Dam	22-Nov-13	<0.2	<0.5	<0.5	<0.5 <sup>#3</sup>	<5	<1	17	10	18	<0.1	10	<5	64	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	1	1.9	<0.8	<0.8	<0.8	<0.8
MM_SS40	WL_SS40	Thompsons Creek Dam	22-Nov-13	<0.2	<0.5	<0.5	<0.5 <sup>#3</sup>	<5	<1	61	21	56	<0.1	24	<5	89	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5
MM_SS40	WL_SSC	Thompsons Creek Dam	22-Nov-13	<0.2	<0.5	<0.5	<0.5 <sup>#3</sup>	16	<1	37	8	58	<0.1	7	<5	51	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5
MM_SS41	WL_SS41	Thompsons Creek Dam	22-Nov-13	<0.2	<0.5	<0.5	<0.5 <sup>#3</sup>	<5	<1	9	6	8	<0.1	3	<5	14	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5

Statistical Summary

Number of Results	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Number of Detects	0	0	0	0	3	1	8	8	8	0	8	0	8	0	8	0	0	0	0	0	0	0	0	0	0	8	8	0	0	0	0
Minimum Concentration	<0.2	<0.5	<0.5	<0.5	<5	<1	6	6	8	<0.1	3	<5	14	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5
Maximum Concentration	<0.2	<0.5	<0.5	<0.5	16	1	61	148	58	<0.1	46	<5	201	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	1	1.9	<0.8	<0.8	<0.8	<0.8
Average Concentration	0.1	0.25	0.25	0.25	5.8	0.56	24	32	30	0.05	17	2.5	77	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.75	1.5	0.31	0.31	0.31	0.31
Median Concentration	0.1	0.25	0.25	0.25	2.5	0.5	21.5	14.5	23	0.05	13.5	2.5	68.5	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.6	1.2	0.25	0.25	0.25	0.25
Standard Deviation	0	0	0	0	5.5	0.18	18	48	19	0	14	0	58	0.078	0.078	0.078	0.078	0.078	0.078	0.078	0.078	0.078	0.078	0.078	0.078	0.21	0.36	0.078	0.078	0.078	0.078
Number of Guideline Exceedances	0	0	0	0	0	0	0	1	2	0	2	0	1	8	8	8	8	8	8	0	0	0	0	0	0	8	8	8	3	8	
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	1	2	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments

- #1 dry wt Sn
- #2 dry wt
- #3 ESDAT Combined.



Table 4m. AEC - MM Sediment Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	Phenols																	
	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	PAHs (Sum of total)	Carcinogenic PAHs (as BaP TEQ)	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,4-dimethylphenol	2,6-dichlorophenol	2-chlorophenol	2-methylphenol	2-nitrophenol	3-&4-methylphenol	4-chloro-3-methylphenol	Pentachlorophenol	Phenol	
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	2	0.5
ISQG-High		1.5 <sup>#2</sup>	2.6 <sup>#2</sup>	45 <sup>#2</sup>														
ISQG-Low		0.24 <sup>#2</sup>	0.665 <sup>#2</sup>	4 <sup>#2</sup>														

Location Code	Field ID	Location	Sampled Date	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	PAHs (Sum of total)	Carcinogenic PAHs (as BaP TEQ)	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,4-dimethylphenol	2,6-dichlorophenol	2-chlorophenol	2-methylphenol	2-nitrophenol	3-&4-methylphenol	4-chloro-3-methylphenol	Pentachlorophenol	Phenol
MM_SS18	WL_SS18	Lake Lyell	21-Nov-13	<0.8	<0.8	<0.8	<0.5	<0.5	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<2	<0.8	<2	<0.8
MM_SS19	WL_SS19	Lake Lyell	21-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<2	<0.5
MM_SS20	WL_SS20	Lake Lyell	21-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<2	<0.5
MM_SS21	WL_SS21	Lake Lyell	21-Nov-13	<0.8	<0.8	<0.8	<0.5	<0.5	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<2	<0.8	<2	<0.8
MM_SS39	WL_SS39	Thompsons Creek Dam	22-Nov-13	<0.8	<0.8	<0.8	<0.5	<0.5	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<2	<0.8	<2	<0.8
MM_SS40	WL_SS40	Thompsons Creek Dam	22-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<2	<0.5
MM_SS40	WL_SSC	Thompsons Creek Dam	22-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<2	<0.5
MM_SS41	WL_SS41	Thompsons Creek Dam	22-Nov-13	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<2	<0.5

Statistical Summary																				
Number of Results	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<2	<0.5	<0.5
Maximum Concentration	<0.8	<0.8	<0.8	<0.5	<0.5	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<2	<0.8	<2	<0.8	<0.8
Average Concentration	0.31	0.31	0.31	0.25	0.25	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.69	0.31	1	0.31	0.31
Median Concentration	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.5	0.25	1	0.25	0.25
Standard Deviation	0.078	0.078	0.078	0	0	0.078	0.078	0.078	0.078	0.078	0.078	0.078	0.078	0.078	0.078	0.26	0.078	0	0.078	0.078
Number of Guideline Exceedances	0	8	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments  
 #1 dry wt Sn  
 #2 dry wt  
 #3 ESDAT Combined.





Table 5a. AEC - MA Water Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	TRH											BTEX							Metals												
	TRH >C6-C9 Fraction	TRH >C10-C14 Fraction	TRH >C15-C28 Fraction	TRH >C29-C36 Fraction	TRH >C10-C36 Fraction	TRH >C6-C10 Fraction	TRH >C6-C10 less BTEX (F1)	TRH >C10-C16 Fraction	TRH >C10-C16 less Naphthalene (F2)	TRH >C16-C34 Fraction	TRH >C34-C40 Fraction	TRH >C10-C40 Fraction	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Total BTEX	Arsenic	Boron	Cadmium	Calcium	Chromium (III+VI)	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	10	50	100	50	50	10	10	50	50	100	100	1	1	1	1	2	2	1	1	5	0.1	500	1	1	50	1	500	1	0.05	1	
Vapour Intrusion - Commercial Worker - 2-<4 m							6200 <sup>#8</sup>	NL <sup>#8</sup>				4900 <sup>#8</sup>	NL <sup>#8</sup>	NL <sup>#8</sup>			NL <sup>#8</sup>														
Vapour Intrusion - Commercial Worker - 4-<8 m							6300 <sup>#7</sup>	NL <sup>#7</sup>				5100 <sup>#7</sup>	NL <sup>#7</sup>	NL <sup>#7</sup>			NL <sup>#7</sup>														
Vapour Intrusion - Commercial Worker - 8 m+							6500 <sup>#6</sup>	NL <sup>#6</sup>				5400 <sup>#6</sup>	NL <sup>#6</sup>	NL <sup>#6</sup>			NL <sup>#6</sup>														
Vapour Intrusion - Intrusive Maint Worker 2m -8m+							NL <sup>#9</sup>	NL <sup>#9</sup>				NL <sup>#9</sup>	NL <sup>#9</sup>	NL <sup>#9</sup>			NL <sup>#9</sup>														
Drinking Water												1 <sup>#11</sup>	800 <sup>#11</sup>	300 <sup>#11</sup>			600 <sup>#11</sup>			10 <sup>#11</sup>	4000 <sup>#11</sup>	2 <sup>#11</sup>		50 <sup>#11</sup>	2000 <sup>#11</sup>		10 <sup>#11</sup>		500 <sup>#2</sup>	1 <sup>#2</sup>	20 <sup>#11</sup>
Ecological (Freshwater)																				13 <sup>#10</sup>	370 <sup>#10</sup>	0.2 <sup>#10</sup>		1 <sup>#10</sup>	1.4 <sup>#10</sup>		3.4 <sup>#10</sup>		1900 <sup>#10</sup>	0.06 <sup>#10</sup>	11 <sup>#10</sup>
Recreational												10 <sup>#5</sup>	8000 <sup>#5</sup>	3000 <sup>#5</sup>			6000 <sup>#5</sup>			100 <sup>#5</sup>	40000 <sup>#5</sup>	20 <sup>#5</sup>		500 <sup>#5</sup>	20000 <sup>#5</sup>		100 <sup>#5</sup>		5000 <sup>#5</sup>	10 <sup>#5</sup>	200 <sup>#5</sup>

Location Code	Field ID	SampleCode	Sampled Date	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	2	<50	<0.1	21,000	<1	2	-	<1	20,000	9870	<0.1	84
MA_MW01	MA_MW01	ES1327570004	16-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	2	<50	<0.1	21,000	<1	2	-	<1	20,000	9870	<0.1	84
MA_MW07	D01_161213_TS	ES1327570002	16-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	2	<50	<0.1	25,000	<1	<1	-	<1	26,000	1840	<0.1	58
MA_MW07	MA_MW07	ES1327570001	16-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	2	<50	<0.1	25,000	<1	<1	-	<1	27,000	1800	<0.1	56
MA_MW07	T01_161213_TS	102901-1	16-Dec-13	<10	<50	<100	<100	-	<10	<10	<50	<50	<100	<100	-	<1	<1	<1	<1	<2	<3	-	<1	30	<0.1	26,000	<1	<1	-	<1	26,000	1700	<0.05	55				
MA_MW12	MA_MW12	ES1327570005	16-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	4	<50	<0.1	32,000	<1	<1	-	<1	36,000	2480	<0.1	42
MA_SS01_W	MA_SS01_W	ES1327282001	12-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	24.7	28	0.95	28,000	12.6	72.8	-	87.8	34,000	22,300	0.3	1770
MA_X_5/D11	MA_X_5/D11	ES1324232005	06-Nov-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	1	<50	<0.1	47,000	<1	2	8460	<1	50,000	1750	<0.1	108
MA_X_MW15	TE_MW15	ES1324232001	05-Nov-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	2	<50	<0.1	42,000	<1	<1	59,800	<1	34,000	7590	<0.1	40
MA_X_MW16	D03_GW_051113	ES1324232009	05-Nov-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	7	<50	0.1	12,000	<1	3	33,000	<1	14,000	6420	<0.1	20
MA_X_MW16	TE_MW16	ES1324232002	05-Nov-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	7	<50	0.1	11,000	<1	3	32,500	<1	14,000	6820	<0.1	20
ML_MW10	ML_MW10	ES1327988003	19-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	10	<50	0.5	116,000	<1	2	-	13	64,000	430	<0.1	106

Statistical Summary

Number of Results	11	11	11	11	10	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	2	4	11	1	6	4	2	11	11	11	1	11	11	1	11	11		
Minimum Concentration	<10	<50	<100	<50	<50	<10	<10	<50	<50	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	28	<0.1	11000	<1	<1	8460	<1	14000	430	<0.05	20		
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	28	0.1	11000	12.6	2	8460	13	14000	430	0.3	20							
Maximum Concentration	<20	<50	<100	<100	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<3	<1	24.7	<50	0.95	116000	12.6	72.8	59800	87.8	64000	22300	0.3	1770	
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	24.7	30	0.95	116000	12.6	72.8	59800	87.8	64000	22300	0.3	1770							
Average Concentration	9.5	25	50	27	25	9.5	9.5	48	48	50	50	50	50	50	50	0.5	0.95	0.95	0.95	1	1	1	1	1	0.5	5.4	26	0.18	35000	1.6	7.9	33440	9.6	31364	5727	0.07	214		
Median Concentration	10	25	50	25	25	10	10	50	50	50	50	50	50	50	0.5	1	1	1	1	1	1	1	1	1	0.5	2	25	0.05	26000	0.5	2	32750	0.5	27000	2480	0.05	56		
Standard Deviation	1.5	0	0	7.5	0	1.5	1.5	7.5	7.5	0	0	0	0	0	0	0.15	0.15	0.15	0	0.15	0	7.2	1.7	0.29	28972	3.6	22	20976	26	15022	6310	0.077	517						
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	1	6	0	2	0	10	10	10	11						
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	1	6	0	2	0	10	10	10	11						

Comments

- #1 WHO (2011) DWQ
- #2 RIVM 2001 (Human-toxicological SRC GW) V Chlorinated Hydrocarbons
- #3 NHMRC 2011 ADWG Health (value for dichloromethane)
- #4 NHMRC 2011 ADWG Health (total 1,2-dichloroethene)
- #5 Guidelines for Managing Risk in Recreational Waters (2008) (GMRRW)
- #6 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 8m+
- #7 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 4-<8 m
- #8 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 2-<4 m
- #9 ASC NEPM (2013) HSL for Intrusive Maint Workers 2m -8m+
- #10 ASC NEPM (2013) GIL - Fresh Waters
- #11 ASC NEPM (2013) GIL - Drinking Water











Table 5a. AEC - MA Water Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	Inorganics											
	Bicarbonate as CaCO3	Carbonate as CaCO3	Cations Total	Chloride	Ferrous Iron	Fluoride	Hydroxide	Ionic Balance	ORP	Sodium (Filtered)	Sulphate	Sulphate (Filtered)
	mg/L	mg/L	meq/L	mg/L	µg/L	mg/L	µg/L	%	mV	mg/L	mg/L	mg/L
EQL			0.01	1	50	0.1		0.01		0.5		1
Vapour Intrusion - Commercial Worker - 2-<4 m												
Vapour Intrusion - Commercial Worker - 4-<8 m												
Vapour Intrusion - Commercial Worker - 8 m+												
Vapour Intrusion - Intrusive Maint Worker 2m -8m+												
Drinking Water												
Ecological (Freshwater)												
Recreational												

Location Code	Field ID	SampleCode	Sampled Date	Bicarbonate as CaCO3	Carbonate as CaCO3	Cations Total	Chloride	Ferrous Iron	Fluoride	Hydroxide	Ionic Balance	ORP	Sodium (Filtered)	Sulphate	Sulphate (Filtered)
MA_MW01	MA_MW01	ES1327570004	16-Dec-13	-	-	4.69	12	20,600	<0.1	-	0.73	-85	38	-	24
MA_MW07	D01_161213_TS	ES1327570002	16-Dec-13	-	-	4.74	10	-	<0.1	-	1.89	-	21	-	176
MA_MW07	MA_MW07	ES1327570001	16-Dec-13	-	-	4.72	11	2340	<0.1	-	1.17	68.7	21	-	175
MA_MW07	T01_161213_TS	102901-1	16-Dec-13	50	<5	-	12	2000	<0.1	<5000	-8.3	-	16	180	-
MA_MW12	MA_MW12	ES1327570005	16-Dec-13	-	-	5.83	19	10,600	<0.1	-	1.99	-45.3	25	-	177
MA_SS01_W	MA_SS01_W	ES1327282001	12-Dec-13	-	-	5.85	19	-	<0.1	-	1.52	-	23	-	210
MA_X_5/D11	MA_X_5/D11	ES1324232005	06-Nov-13	-	-	7.58	12	-	0.1	-	0.03	44.4	21	-	251
MA_X_MW15	TE_MW15	ES1324232001	05-Nov-13	-	-	7.07	54	-	0.2	-	0.2	-82.2	36	-	70
MA_X_MW16	D03_GW_051113	ES1324232009	05-Nov-13	-	-	4.25	40	-	<0.1	-	5.69	-	54	-	95
MA_X_MW16	TE_MW16	ES1324232002	05-Nov-13	-	-	4.25	42	-	<0.1	-	5.92	54.7	55	-	93
ML_MW10	ML_MW10	ES1327988003	19-Dec-13	-	-	14.3	109	180	0.2	-	0.93	78.4	65	-	108

**Statistical Summary**

Number of Results	1	1	10	11	5	11	1	11	7	11	1	10
Number of Detects	1	0	10	11	5	3	0	11	7	11	1	10
Minimum Concentration	50	<5	4.25	10	180	<0.1	<5000	-8.3	-85	16	180	24
Minimum Detect	50	ND	4.25	10	180	0.1	ND	ND	ND	16	180	24
Maximum Concentration	50	<5	14.3	109	20600	0.2	<5000	5.92	78.4	65	180	251
Maximum Detect	50	ND	14.3	109	20600	0.2	ND	5.92	78.4	65	180	251
Average Concentration			6.3	31	7144	0.082		1.1	4.8	34		138
Median Concentration	50	2.5	5.285	19	2340	0.05	2500	1.17	44.4	25	180	141.5
Standard Deviation			3	30	8530	0.06		3.7	73	17		70
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0

**Comments**

- #1 WHO (2011) DWQ
- #2 RIVM 2001 (Human-toxicological SRC GW) V Chlorinated Hydrocarbons
- #3 NHMRC 2011 ADWG Health (value for dichloromethane)
- #4 NHMRC 2011 ADWG Health (total 1,2-dichloroethene)
- #5 Guidelines for Managing Risk in Recreational Waters (2008) (GMRRW)
- #6 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 8m+
- #7 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 4-<8 m
- #8 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 2-<4 m
- #9 ASC NEPM (2013) HSL for Intrusive Maint Workers 2m -8m+
- #10 ASC NEPM (2013) GIL - Fresh Waters
- #11 ASC NEPM (2013) GIL - Drinking Water



Table 5b. AEC - MB Water Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	TRH											BTEX							Metals								
	TRH >C6-C9 Fraction	TRH >C10-C14 Fraction	TRH >C15-C28 Fraction	TRH >C29-C36 Fraction	TRH >C10-C36 Fraction	TRH >C6-C10 Fraction	TRH >C6-C10 less BTEX (F1)	TRH >C10-C16 Fraction	TRH >C10-C16 less Naphthalene (F2)	TRH >C16-C34 Fraction	TRH >C34-C40 Fraction	TRH >C10-C40 Fraction	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Total BTEX	Arsenic	Boron	Cadmium	Calcium	Chromium (III+VI)	Copper	Lead	Magnesium
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	20	50	100	50	50	20	20	100	100	100	100	100	1	2	2	2	2	2	1	0.2	5	0.05	1000	0.2	0.5	0.1	1000
Vapour Intrusion - Commercial Worker - 2-<4 m							6200 <sup>#8</sup>	NL <sup>#8</sup>				4900 <sup>#8</sup>	NL <sup>#8</sup>	NL <sup>#8</sup>			NL <sup>#8</sup>										
Vapour Intrusion - Commercial Worker - 4-<8 m							6300 <sup>#7</sup>	NL <sup>#7</sup>				5100 <sup>#7</sup>	NL <sup>#7</sup>	NL <sup>#7</sup>			NL <sup>#7</sup>										
Vapour Intrusion - Commercial Worker - 8 m+							6500 <sup>#6</sup>	NL <sup>#6</sup>				5400 <sup>#6</sup>	NL <sup>#6</sup>	NL <sup>#6</sup>			NL <sup>#6</sup>										
Vapour Intrusion - Intrusive Maint Worker 2m -8m+							NL <sup>#9</sup>	NL <sup>#9</sup>				NL <sup>#9</sup>	NL <sup>#9</sup>	NL <sup>#9</sup>			NL <sup>#9</sup>										
Drinking Water												1 <sup>#11</sup>	800 <sup>#11</sup>	300 <sup>#11</sup>			600 <sup>#11</sup>			10 <sup>#11</sup>	4000 <sup>#11</sup>	2 <sup>#11</sup>		50 <sup>#11</sup>	2000 <sup>#11</sup>	10 <sup>#11</sup>	
Ecological (Freshwater)																				13 <sup>#10</sup>	370 <sup>#10</sup>	0.2 <sup>#10</sup>		1 <sup>#10</sup>	1.4 <sup>#10</sup>	3.4 <sup>#10</sup>	
Recreational												10 <sup>#5</sup>	8000 <sup>#5</sup>	3000 <sup>#5</sup>			6000 <sup>#5</sup>			100 <sup>#5</sup>	40000 <sup>#5</sup>	20 <sup>#5</sup>		500 <sup>#5</sup>	20000 <sup>#5</sup>	100 <sup>#5</sup>	

Location Code	Field ID	SampleCode	Sampled Date	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	5	<50	<0.1	47,000	<1	3	<1	34,000
MB_MW02	MB_MW02	ES1328003003	18-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	5	<50	<0.1	47,000	<1	3	<1	34,000
MB_MW03	MB_MW03	ES1328003005	18-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	<1	<50	<0.1	18,000	<1	1	<1	21,000
MB_MW04	MB_MW04	ES1328001003	19-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	7.2	18	<0.05	36,000	<0.2	<0.5	<0.1	54,000
MB_MW05	MB_MW05	ES1328003001	18-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	1	<50	0.4	23,000	<1	1	8	19,000
ME_MW06	ME_MW06	ES1328000004	19-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	6.4	17	<0.05	36,000	<0.2	<0.5	<0.1	68,000

Statistical Summary	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Number of Results	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	2	1	5	0	3	1	5	
Minimum Concentration	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	<1	17	<0.05	18000	<0.2	<0.5	<0.1	19000
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	17	0.4	18000	ND	1	8	19000	
Maximum Concentration	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	7.2	<50	0.4	47000	<1	3	8	68000
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.2	18	0.4	47000	ND	3	8	68000	
Average Concentration	10	25	50	25	25	10	10	50	50	50	50	50	50	50	0.5	1	1	1	1	1	0.5	4	22	0.11	32000	0.34	1.1	1.8	39200	
Median Concentration	10	25	50	25	25	10	10	50	50	50	50	50	50	50	0.5	1	1	1	1	1	0.5	5	25	0.05	36000	0.5	1	0.5	34000	
Standard Deviation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.1	4.1	0.16	11554	0.22	1.1	3.5	21300	
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	

Comments

- #1 WHO (2011) DWQ
- #2 RIVM 2001 (Human-toxicological SRC GW) V Chlorinated Hydrocarbons
- #3 NHMRC 2011 ADWG Health (value for dichloromethane)
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- #7 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 4-<8 m
- #8 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 2-<4 m
- #9 ASC NEPM (2013) HSL for Intrusive Maint Workers 2m -8m+
- #10 ASC NEPM (2013) GIL - Fresh Waters
- #11 ASC NEPM (2013) GIL - Drinking Water



Table 5b. AEC - MB Water Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

							PAH																	Phenols							
	Manganese	Mercury	Nickel	Potassium	Selenium	Zinc	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Naphthalene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	PAHs (Sum of total)	Carcinogenic PAHs (as BaP TEQ)	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,4-dimethylphenol	2,6-dichlorophenol	2-chlorophenol	2-methylphenol
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	0.5	0.1	0.5	1000	0.2	1	1	1	1	0.5	1	1	1	1	1	1	1	1	1	1	1	1	0.5	0.5	1	1	1	1	1	1	1
Vapour Intrusion - Commercial Worker - 2-<4 m														NL <sup>#8</sup>																	
Vapour Intrusion - Commercial Worker - 4-<8 m														NL <sup>#7</sup>																	
Vapour Intrusion - Commercial Worker - 8 m+														NL <sup>#6</sup>																	
Vapour Intrusion - Intrusive Maint Worker 2m -8m+														NL <sup>#9</sup>																	
Drinking Water	500 <sup>#2</sup>	1 <sup>#2</sup>	20 <sup>#11</sup>		10 <sup>#11</sup>					0.01 <sup>#2</sup>													0.01 <sup>#2</sup>		20 <sup>#2</sup>	200 <sup>#2</sup>				300 <sup>#2</sup>	
Ecological (Freshwater)	1900 <sup>#10</sup>	0.06 <sup>#10</sup>	11 <sup>#10</sup>		5 <sup>#10</sup>	8 <sup>#10</sup>								16 <sup>#10</sup>																	
Recreational	5000 <sup>#5</sup>	10 <sup>#5</sup>	200 <sup>#5</sup>		100 <sup>#5</sup>					0.1 <sup>#5</sup>													0.1 <sup>#5</sup>		200 <sup>#5</sup>	2000 <sup>#5</sup>				3000 <sup>#5</sup>	

Location Code	Field ID	SampleCode	Sampled Date	Manganese	Mercury	Nickel	Potassium	Selenium	Zinc	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Naphthalene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	PAHs (Sum of total)	Carcinogenic PAHs (as BaP TEQ)	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,4-dimethylphenol	2,6-dichlorophenol	2-chlorophenol	2-methylphenol	
MB_MW02	MB_MW02	ES1328003003	18-Dec-13	3710	<0.1	106	6000	<10	331	<1	<1	<1	<1	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1
MB_MW03	MB_MW03	ES1328003005	18-Dec-13	1120	<0.1	46	7000	<10	123	<1	<1	<1	<1	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1
MB_MW04	MB_MW04	ES1328001003	19-Dec-13	3690	<0.1	136	9000	<0.2	19	<1	<1	<1	<1	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1
MB_MW05	MB_MW05	ES1328003001	18-Dec-13	1500	<0.1	138	6000	<10	460	<1	<1	<1	<1	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1
ME_MW06	ME_MW06	ES1328000004	19-Dec-13	12,600	<0.1	153	5000	<0.2	22	<1	<1	<1	<1	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1

Statistical Summary	Manganese	Mercury	Nickel	Potassium	Selenium	Zinc	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Naphthalene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	PAHs (Sum of total)	Carcinogenic PAHs (as BaP TEQ)	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,4-dimethylphenol	2,6-dichlorophenol	2-chlorophenol	2-methylphenol				
Number of Results	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5		
Number of Detects	5	0	5	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Minimum Concentration	1120	<0.1	46	5000	<0.2	19	<1	<1	<1	<1	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Minimum Detect	1120	ND	46	5000	ND	19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Maximum Concentration	12600	<0.1	153	9000	<10	460	<1	<1	<1	<1	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Maximum Detect	12600	ND	153	9000	ND	460	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration	4524	0.05	116	6600	3	191	0.5	0.5	0.5	0.5	0.25	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.25	0.25	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
Median Concentration	3690	0.05	136	6000	5	123	0.5	0.5	0.5	0.5	0.25	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.25	0.25	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
Standard Deviation	4672	0	43	1517	2.7	197	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances	5	5	5	0	3	5	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	5	0	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

- Comments**
- #1 WHO (2011) DWQ
  - #2 RIVM 2001 (Human-toxicological SRC GW) V Chlorinated Hydrocarbons
  - #3 NHMRC 2011 ADWG Health (value for dichloromethane)
  - #4 NHMRC 2011 ADWG Health (total 1,2-dichloroethene)
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  - #6 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 8m+
  - #7 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 4-<8 m
  - #8 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 2-<4 m
  - #9 ASC NEPM (2013) HSL for Intrusive Maint Workers 2m -8m+
  - #10 ASC NEPM (2013) GIL - Fresh Waters
  - #11 ASC NEPM (2013) GIL - Drinking Water



Table 5b. AEC - MB Water Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	Organics					Inorganics														
	2-nitrophenol µg/L	3-&4-methylphenol µg/L	4-chloro-3-methylphenol µg/L	Pentachlorophenol µg/L	Phenol µg/L	Alkalinity (Bicarbonate as CaCO3) mg/L	Alkalinity (Carbonate as CaCO3) mg/L	Alkalinity (Hydroxide) as CaCO3 mg/L	Alkalinity (total) as CaCO3 mg/L	Anions Total meq/L	Cations Total meq/L	Chloride mg/L	Ferrous Iron µg/L	Fluoride mg/L	Ionic Balance %	ORP mV	Sodium (Filtered) mg/L	Sulphate (Filtered) mg/L	Sulphate as S (Filtered) mg/L	
EQL	1	2	1	2	1	1	1	1000	1	0.01	0.01	1	50	0.1	0.01		1	1	1	
Vapour Intrusion - Commercial Worker - 2-<4 m																				
Vapour Intrusion - Commercial Worker - 4-<8 m																				
Vapour Intrusion - Commercial Worker - 8 m+																				
Vapour Intrusion - Intrusive Maint Worker 2m -8m+																				
Drinking Water				0.05 <sup>#2</sup>																
Ecological (Freshwater)					320 <sup>#10</sup>															
Recreational				0.5 <sup>#5</sup>																

Location Code	Field ID	SampleCode	Sampled Date	2-nitrophenol	3-&4-methylphenol	4-chloro-3-methylphenol	Pentachlorophenol	Phenol	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Carbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ferrous Iron	Fluoride	Ionic Balance	ORP	Sodium (Filtered)	Sulphate (Filtered)	Sulphate as S (Filtered)
MB_MW02	MB_MW02	ES1328003003	18-Dec-13	<1	<2	<1	<2	<1	122	<1	<1000	122	6.91	7.17	36	12,100	0.1	1.8	51.9	35	166	-
MB_MW03	MB_MW03	ES1328003005	18-Dec-13	<1	<2	<1	<2	<1	17	<1	<1000	17	4.63	4.46	34	10,900	<0.1	1.89	156.2	38	160	-
MB_MW04	MB_MW04	ES1328001003	19-Dec-13	<1	<2	<1	<2	<1	315	<1	<1000	315	8.11	8.05	35	8790	0.1	0.46	-14.8	33	-	40
MB_MW05	MB_MW05	ES1328003001	18-Dec-13	<1	<2	<1	<2	<1	22	<1	<1000	22	6.49	6.25	64	21,600	0.1	1.24	138.1	56	204	-
ME_MW06	ME_MW06	ES1328000004	19-Dec-13	<1	<2	<1	<2	<1	329	<1	<1000	329	9.28	9.09	57	16,700	0.1	1.1	-44.2	36	53	-

Statistical Summary

Number of Results	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	1
Number of Detects	0	0	0	0	0	5	0	0	5	5	5	5	5	5	5	4	5	5	5	4	1
Minimum Concentration	<1	<2	<1	<2	<1	17	<1	<1000	17	4.63	4.46	34	8790	<0.1	0.46	-44.2	33	53	40		
Minimum Detect	ND	ND	ND	ND	ND	17	ND	ND	17	4.63	4.46	34	8790	0.1	0.46	ND	33	53	40		
Maximum Concentration	<1	<2	<1	<2	<1	329	<1	<1000	329	9.28	9.09	64	21600	0.1	1.89	156.2	56	204	40		
Maximum Detect	ND	ND	ND	ND	ND	329	ND	ND	329	9.28	9.09	64	21600	0.1	1.89	156.2	56	204	40		
Average Concentration	0.5	1	0.5	1	0.5	161	0.5	500	161	7.1	7	45	14018	0.09	1.3	57	40	146			
Median Concentration	0.5	1	0.5	1	0.5	122	0.5	500	122	6.91	7.17	36	12100	0.1	1.24	51.9	36	163	40		
Standard Deviation	0	0	0	0	0	153	0	0	153	1.8	1.8	14	5134	0.022	0.58	89	9.3	65			
Number of Guideline Exceedances	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments

- #1 WHO (2011) DWQ
- #2 RIVM 2001 (Human-toxicological SRC GW) V Chlorinated Hydrocarbons
- #3 NHMRC 2011 ADWG Health (value for dichloromethane)
- #4 NHMRC 2011 ADWG Health (total 1,2-dichloroethene)
- #5 Guidelines for Managing Risk in Recreational Waters (2008) (GMRRW)
- #6 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 8m+
- #7 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 4-<8 m
- #8 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 2-<4 m
- #9 ASC NEPM (2013) HSL for Intrusive Maint Workers 2m -8m+
- #10 ASC NEPM (2013) GIL - Fresh Waters
- #11 ASC NEPM (2013) GIL - Drinking Water





Table 5c. AEC - MC Water Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	TRH										BTEX						Metals																	
	TRH > C6-C9 Fraction	TRH > C10-C14 Fraction	TRH > C15-C28 Fraction	TRH > C29-C36 Fraction	TRH > C10-C36 Fraction	TRH > C6-C10 Fraction	TRH > C6-C10 less BTEX (F1)	TRH > C10-C16 Fraction	TRH > C10-C16 less Naphthalene (F2)	TRH > C16-C34 Fraction	TRH > C34-C40 Fraction	TRH > C10-C40 Fraction	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Total BTEX	Arsenic	Boron	Cadmium	Calcium	Chromium (III+VI)	Copper	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Zinc	Acenaphthene
EQ/L	20	50	100	50	50	20	20	100	100	100	100	1	2	2	2	2	2	1	0.2	5	0.05	1000	0.2	0.5	0.1	1000	0.5	0.1	0.5	1000	0.2	1	1	
Vapour Intrusion - Commercial Worker - 2-<4 m						6200 <sup>#8</sup>		NL <sup>#8</sup>				4900 <sup>#8</sup>	NL <sup>#8</sup>	NL <sup>#8</sup>			NL <sup>#8</sup>																	
Vapour Intrusion - Commercial Worker - 4-<8 m						6300 <sup>#7</sup>		NL <sup>#7</sup>				5100 <sup>#7</sup>	NL <sup>#7</sup>	NL <sup>#7</sup>			NL <sup>#7</sup>																	
Vapour Intrusion - Commercial Worker - 8 m+						6500 <sup>#6</sup>		NL <sup>#6</sup>				5400 <sup>#6</sup>	NL <sup>#6</sup>	NL <sup>#6</sup>			NL <sup>#6</sup>																	
Vapour Intrusion - Intrusive Maint Worker 2m -8m+						NL <sup>#9</sup>		NL <sup>#9</sup>				NL <sup>#9</sup>	NL <sup>#9</sup>	NL <sup>#9</sup>			NL <sup>#9</sup>																	
Drinking Water												1 <sup>#11</sup>	800 <sup>#11</sup>	300 <sup>#11</sup>			600 <sup>#11</sup>			10 <sup>#11</sup>	4000 <sup>#11</sup>	2 <sup>#11</sup>		50 <sup>#11</sup>	2000 <sup>#11</sup>	10 <sup>#11</sup>		500 <sup>#2</sup>	1 <sup>#2</sup>	20 <sup>#11</sup>	10 <sup>#11</sup>			
Ecological (Freshwater)																				13 <sup>#10</sup>	370 <sup>#10</sup>	0.2 <sup>#10</sup>		1 <sup>#10</sup>	1.4 <sup>#10</sup>	3.4 <sup>#10</sup>		1900 <sup>#10</sup>	0.06 <sup>#10</sup>	11 <sup>#10</sup>	5 <sup>#10</sup>	8 <sup>#10</sup>		
Recreational												10 <sup>#5</sup>	8000 <sup>#5</sup>	3000 <sup>#5</sup>			6000 <sup>#5</sup>			100 <sup>#5</sup>	40000 <sup>#5</sup>	20 <sup>#5</sup>		500 <sup>#5</sup>	20000 <sup>#5</sup>	100 <sup>#5</sup>		5000 <sup>#5</sup>	10 <sup>#5</sup>	200 <sup>#5</sup>	100 <sup>#5</sup>			

Location Code	Field ID	SampleCode	Sampled Date	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	<1	<50	<0.1	45,000	<1	1	<1	20,000	236	<0.1	2	19,000	<10	14	<1	
MC_MW01	MC_MW01	ES1327570006	16-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	<1	50	<0.1	67,000	<1	2	26	27,000	1660	<0.1	11	27,000	<10	17	<1	
MC_MW02	MC_MW02	ES1327570007	16-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	<1	3.4	41	<0.05	70,000	<0.2	1.1	0.1	57,000	9130	<0.1	112	29,000	<0.2	26	<1
MC_MW03	MC_MW03	ES1328041001	17-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	<1	104	46	0.55	52,000	<0.2	0.6	<0.1	25,000	1100	<0.1	83.2	22,000	<0.2	32	<1
MC_MW04	MC_MW04	MC_MW04	17-Dec-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MC_MW04	MC-MW04	ES1328041002	17-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	<1	104	46	0.55	52,000	<0.2	0.6	<0.1	25,000	1100	<0.1	83.2	22,000	<0.2	32	<1
ML_MW12	ML_MW12	ES1327570003	16-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	<1	<1	<50	<0.1	18,000	<1	2	6	17,000	2920	<0.1	17	8000	<10	50	<1
ML_MW15	ML_MW15	ES1327988002	19-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	<1	12	<50	0.4	60,000	<1	<1	<1	26,000	1240	<0.1	19	14,000	<10	18	<1

Statistical Summary	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
Number of Results	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	<1	41	<0.05	18000	<0.2	0.6	<0.1	17000	236	<0.1	2	8000	<0.2	14	<1	<1			
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.4	41	0.4	18000	ND	0.6	0.1	17000	236	ND	2	8000	ND	14	ND		
Maximum Concentration	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	<1	104	50	0.55	70000	<1	2	26	57000	9130	<0.1	112	29000	<10	50	<1			
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	104	50	0.55	70000	ND	2	26	57000	9130	ND	112	29000	ND	50	ND			
Average Concentration	10	25	50	25	25	10	10	50	50	50	50	50	50	50	50	0.5	1	1	1	1	1	0.5	20	35	0.19	52000	0.37	1.2	5.5	28667	2714	0.05	41	19833	3.4	26	0.5				
Median Concentration	10	25	50	25	25	10	10	50	50	50	50	50	50	50	50	0.5	1	1	1	1	1	0.5	1.95	33	0.05	56000	0.5	1.05	0.5	25500	1450	0.05	18	20500	5	22	0.5				
Standard Deviation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41	12	0.23	19068	0.21	0.66	10	14404	3263	0	45	7935	2.5	13	0			
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

- Comments
- #1 WHO (2011) DWQ
  - #2 RIVM 2001 (Human-toxicological SRC GW) V Chlorinated Hydrocarbons
  - #3 NHMRC 2011 ADWG Health (value for dichloromethane)
  - #4 NHMRC 2011 ADWG Health (total 1,2-dichloroethene)
  - #5 Guidelines for Managing Risk in Recreational Waters (2008) (GMRRW)
  - #6 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 8m+
  - #7 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 4-<8 m
  - #8 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 2-<4 m
  - #9 ASC NEPM (2013) HSL for Intrusive Maint Workers 2m -8m+
  - #10 ASC NEPM (2013) GIL - Fresh Waters
  - #11 ASC NEPM (2013) GIL - Drinking Water







Table 5c. AEC - MC Water Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	Halogenated Hydrocarbons					Solvents					Polychlorinated Biphenyls	Inorganics												
	1,2-dibromoethane µg/L	Bromomethane µg/L	Dichlorodifluoromethane µg/L	Iodomethane µg/L	Trichlorofluoromethane µg/L	Methyl Ethyl Ketone µg/L	2-hexanone (MBK) µg/L	4-Methyl-2-pentanone µg/L	Carbon disulfide µg/L	Vinyl acetate µg/L	PCBs (Sum of total) µg/L	Alkalinity (Bicarbonate as CaCO3) mg/L	Alkalinity (Carbonate as CaCO3) mg/L	Alkalinity (Hydroxide) as CaCO3 µg/L	Alkalinity (total) as CaCO3 mg/L	Anions Total meq/L	Cations Total meq/L	Chloride mg/L	Ferrous Iron µg/L	Fluoride mg/L	Ionic Balance %	ORP mV	Sodium (Filtered) mg/L	Sulphate (Filtered) mg/L
EQL	5	50	50	5	50	50	50	5	50	1	1	1	1000	1	0.01	0.01	1	50	0.1	0.01			1	1
Vapour Intrusion - Commercial Worker - 2-<4 m																								
Vapour Intrusion - Commercial Worker - 4-<8 m																								
Vapour Intrusion - Commercial Worker - 8 m+																								
Vapour Intrusion - Intrusive Maint Worker 2m -8m+																								
Drinking Water	#11	#11																						
Ecological (Freshwater)																								
Recreational	10 <sup>#5</sup>	10 <sup>#5</sup>																						

Location Code	Field ID	SampleCode	Sampled Date	1,2-dibromoethane	Bromomethane	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane	Methyl Ethyl Ketone	2-hexanone (MBK)	4-Methyl-2-pentanone	Carbon disulfide	Vinyl acetate	PCBs (Sum of total)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Carbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ferrous Iron	Fluoride	Ionic Balance	ORP	Sodium (Filtered)	Sulphate (Filtered)
MC_MW01	MC_MW01	ES1327570006	16-Dec-13	<5	<50	<50	<5	<50	<50	<50	<50	<5	<50	<1	225	<1	<1000	225	5.43	5.13	20	4300	0.1	2.92	-28.2	12	18
MC_MW02	MC_MW02	ES1327570007	16-Dec-13	<5	<50	<50	<5	<50	<50	<50	<50	<5	<50	<1	240	<1	<1000	240	7.26	7.39	29	<50	0.1	0.89	64.8	26	79
MC_MW03	MC_MW03	ES1328041001	17-Dec-13	<5	<50	<50	<5	<50	<50	<50	<50	<5	<50	<1	317	<1	<1000	317	10.7	10.6	27	760	0.2	0.56	-20.5	38	173
MC_MW04	MC_MW04	MC_MW04	17-Dec-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-7.1	-	-
MC_MW04	MC-MW04	ES1328041002	17-Dec-13	<5	<50	<50	<5	<50	<50	<50	<50	<5	<50	<1	148	<1	<1000	148	7.42	7.56	27	2850	0.2	0.93	-	54	178
ML_MW12	ML_MW12	ES1327570003	16-Dec-13	<5	<50	<50	<5	<50	<50	<50	<50	<5	<50	<1	114	<1	<1000	114	5.62	5.42	77	3680	<0.1	1.82	52.3	67	56
ML_MW15	ML_MW15	ES1327988002	19-Dec-13	<5	<50	<50	<5	<50	<50	<50	<50	<5	<50	<1	215	<1	<1000	215	6.59	6.84	48	3250	0.2	1.9	-78.7	31	45

Statistical Summary

Number of Results	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	6	6	6	6	5	5	6	6	6	6	6
Minimum Concentration	<5	<50	<50	<5	<50	<50	<50	<50	<50	<50	<50	<5	<50	<1	114	<1	<1000	114	5.43	5.13	20	<50	<0.1	0.56	-78.7	12	18	
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	114	ND	ND	114	5.43	5.13	20	760	0.1	0.56	ND	12	18	
Maximum Concentration	<5	<50	<50	<5	<50	<50	<50	<50	<50	<50	<50	<5	<50	<1	317	<1	<1000	317	10.7	10.6	77	4300	0.2	2.92	64.8	67	178	
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	317	ND	ND	317	10.7	10.6	77	4300	0.2	2.92	64.8	67	178	
Average Concentration	2.5	25	25	2.5	25	25	25	25	25	25	25	2.5	25	0.5	210	0.5	500	210	7.2	7.2	38	2478	0.14	1.5	-2.9	38	92	
Median Concentration	2.5	25	25	2.5	25	25	25	25	25	25	25	2.5	25	0.5	220	0.5	500	220	6.925	7.115	28	3050	0.15	1.375	-13.8	34.5	67.5	
Standard Deviation	0	0	0	0	0	0	0	0	0	0	0	0	0	72	0	0	72	1.9	2	21	1701	0.066	0.88	54	20	68		
Number of Guideline Exceedances	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments

- #1 WHO (2011) DWQ
- #2 RIVM 2001 (Human-toxicological SRC GW) V Chlorinated Hydrocarbons
- #3 NHMRC 2011 ADWG Health (value for dichloromethane)
- #4 NHMRC 2011 ADWG Health (total 1,2-dichloroethene)
- #5 Guidelines for Managing Risk in Recreational Waters (2008) (GMRRW)
- #6 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 8m+
- #7 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 4-<8 m
- #8 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 2-<4 m
- #9 ASC NEPM (2013) HSL for Intrusive Maint Workers 2m -8m+
- #10 ASC NEPM (2013) GIL - Fresh Waters
- #11 ASC NEPM (2013) GIL - Drinking Water











Table 5d. AEC - MD Water Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	Solvents						Polychlorinated Biphenyls	Inorganics																			
	Methyl Ethyl Ketone	2-hexanone (MBK)	4-Methyl-2-pentanone	Carbon disulfide	Cyclohexane	Vinyl acetate	PCBs (Sum of total)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Carbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Bicarbonate as CaCO3	Carbonate as CaCO3	Cations Total	Chloride	Ferrous Iron	Fluoride	Hydroxide	Ionic Balance	ORP	Sodium (Filtered)	Sulphate	Sulphate (Filtered)	Sulphate as S (Filtered)		
EQL	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	mg/L	µg/L	mg/L	µg/L	%	mV	mg/L	mg/L	mg/L	mg/L		
Vapour Intrusion - Commercial Worker - 2-<4 m							1	1	1	1000	1	0.01			0.01	1	50	0.1			0.01						
Vapour Intrusion - Commercial Worker - 4-<8 m																											
Vapour Intrusion - Commercial Worker - 8 m+																											
Vapour Intrusion - Intrusive Maint Worker 2m -8m+																											
Drinking Water																											
Ecological (Freshwater)																											
Recreational																											

Location Code	Field ID	SampleCode	Sampled Date	<50	<50	<50	<5	-	<50	-	102	<1	<1000	102	4.15	-	-	4.2	13	4400	0.1	-	0.5	-45.6	32	-	84	-
MD_MW01	MD-MW01	ES1328041003	17-Dec-13	<50	<50	<50	<5	-	<50	-	73	<1	<1000	73	9.53	-	-	9.17	146	-	0.1	-	1.94	-	176	-	190	-
MD_MW03	MD-MW03	ES1328041004	17-Dec-13	<50	<50	<50	<5	-	<50	-	72	<1	<1000	72	9.53	-	-	9.17	145	8800	0.1	-	1.91	156	176	-	192	-
MD_MW03	T01_171213_TS	103024-1	17-Dec-13	-	-	-	-	-	<0.001	-	-	-	-	-	-	17	<5	-	140	-	-	<5000	2.4	-	190	260	-	-
MD_MW04	MD_MW04	ES1328041006	17-Dec-13	<50	<50	<50	<5	-	<50	-	114	<1	<1000	114	3.38	-	-	3.5	6	3090	0.3	-	1.67	-0.8	29	-	45	-
MK_SB16	MK_MW01	ES1328002006	18-Dec-13	<50	<50	<50	<5	-	<50	<1	160	<1	<1000	160	3.79	-	-	3.68	7	60	0.2	-	1.49	78.2	19	-	-	19
MK_SB78	MK_MW08	ES1328001004	19-Dec-13	<50	<50	<50	<5	-	<50	-	-	-	-	-	-	-	-	-	-	650	-	-	-	30.4	-	-	-	-

Statistical Summary																											
Number of Results	6	6	6	6	1	6	1	5	5	5	5	5	5	1	1	5	6	5	5	1	6	5	6	1	4	1	
Number of Detects	0	0	0	0	0	0	0	5	0	0	5	5	1	0	5	6	5	5	0	6	5	6	1	4	1		
Minimum Concentration	<50	<50	<50	<5	<0.001	<50	<1	72	<1	<1000	72	3.38	17	<5	3.5	6	60	0.1	<5000	0.5	-45.6	19	260	45	19		
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	72	ND	ND	72	3.38	17	ND	3.5	6	60	0.1	ND	0.5	ND	19	260	45	19		
Maximum Concentration	<50	<50	<50	<5	<0.001	<50	<1	160	<1	<1000	160	9.53	17	<5	9.17	146	8800	0.3	<5000	2.4	156	190	260	192	19		
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	160	ND	ND	160	9.53	17	ND	9.17	146	8800	0.3	ND	2.4	156	190	260	192	19		
Average Concentration	25	25	25	2.5	0.0005	25	0.5	104	0.5	500	104	6.1			5.9	76	3400	0.16		1.7	44	104		128			
Median Concentration	25	25	25	2.5	0.0005	25	0.5	102	0.5	500	102	4.15	17	2.5	4.2	76.5	3090	0.1	2500	1.79	30.4	104	260	137	19		
Standard Deviation	0	0	0	0	0	0	0	36	0	0	36	3.2			3	74	3499	0.089		0.64	77	85		75			
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

- Comments
- #1 WHO (2011) DWQ
  - #2 RIVM 2001 (Human-toxicological SRC GW) V Chlorinated Hydrocarbons
  - #3 NHMRC 2011 ADWG Health (value for dichloromethane)
  - #4 NHMRC 2011 ADWG Health (total 1,2-dichloroethene)
  - #5 Guidelines for Managing Risk in Recreational Waters (2008) (GMRRW)
  - #6 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 8m+
  - #7 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 4-<8 m
  - #8 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 2-<4 m
  - #9 ASC NEPM (2013) HSL for Intrusive Maint Workers 2m -8m+
  - #10 ASC NEPM (2013) GIL - Fresh Waters
  - #11 ASC NEPM (2013) GIL - Drinking Water





Table 5e. AEC - ME Water Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	TRH										BTEX						Metals																	
	TRH > C6-C9 Fraction	TRH > C10-C14 Fraction	TRH > C15-C28 Fraction	TRH > C29-C36 Fraction	TRH > C10-C36 Fraction	TRH > C6-C10 Fraction	TRH > C6-C10 less BTEX (F1)	TRH > C10-C16 Fraction	TRH > C10-C16 less Naphthalene (F2)	TRH > C16-C34 Fraction	TRH > C34-C40 Fraction	TRH > C10-C40 Fraction	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Total BTEX	Arsenic	Boron	Cadmium	Calcium	Chromium (III+VI)	Copper	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Zinc	Acenaphthene
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	20	50	100	50	50	20	20	100	100	100	100	1	2	2	2	2	2	1	0.2	5	0.05	1000	0.2	0.5	0.1	1000	0.5	0.1	0.5	1000	0.2	1	1	
Vapour Intrusion - Commercial Worker - 2-<4 m							6200 <sup>#5</sup>		NL <sup>#5</sup>			4900 <sup>#5</sup>	NL <sup>#5</sup>	NL <sup>#5</sup>			NL <sup>#5</sup>																	
Vapour Intrusion - Commercial Worker - 4-<8 m							6300 <sup>#7</sup>		NL <sup>#7</sup>			5100 <sup>#7</sup>	NL <sup>#7</sup>	NL <sup>#7</sup>			NL <sup>#7</sup>																	
Vapour Intrusion - Commercial Worker - 8 m+							6500 <sup>#6</sup>		NL <sup>#6</sup>			5400 <sup>#6</sup>	NL <sup>#6</sup>	NL <sup>#6</sup>			NL <sup>#6</sup>																	
Vapour Intrusion - Intrusive Maint Worker 2m -8m+							NL <sup>#9</sup>		NL <sup>#9</sup>			NL <sup>#9</sup>	NL <sup>#9</sup>	NL <sup>#9</sup>			NL <sup>#9</sup>																	
Drinking Water												1 <sup>#11</sup>	800 <sup>#11</sup>	300 <sup>#11</sup>			600 <sup>#11</sup>		10 <sup>#11</sup>	4000 <sup>#11</sup>	2 <sup>#11</sup>		50 <sup>#11</sup>	2000 <sup>#11</sup>	10 <sup>#11</sup>		500 <sup>#2</sup>	1 <sup>#2</sup>	20 <sup>#11</sup>		10 <sup>#11</sup>			
Ecological (Freshwater)																			13 <sup>#10</sup>	370 <sup>#10</sup>	0.2 <sup>#10</sup>		1 <sup>#10</sup>	1.4 <sup>#10</sup>	3.4 <sup>#10</sup>		1900 <sup>#10</sup>	0.06 <sup>#10</sup>	11 <sup>#10</sup>		5 <sup>#10</sup>	8 <sup>#10</sup>		
Recreational												10 <sup>#5</sup>	8000 <sup>#5</sup>	3000 <sup>#5</sup>			6000 <sup>#5</sup>		100 <sup>#5</sup>	40000 <sup>#5</sup>	20 <sup>#5</sup>		500 <sup>#5</sup>	20000 <sup>#5</sup>	100 <sup>#5</sup>		5000 <sup>#5</sup>	10 <sup>#5</sup>	200 <sup>#5</sup>		100 <sup>#5</sup>			

Location Code	Field ID	SampleCode	Sampled Date	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	1.6	18	0.13	56,000	<0.2	<0.5	<0.1	86,000	9090	<0.1	80.5	9000	<0.2	18	<1
ME_X_MW01	ME_X_MW01	ES1328000002	19-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	1.6	18	0.13	56,000	<0.2	<0.5	<0.1	86,000	9090	<0.1	80.5	9000	<0.2	18	<1
ME_X_MW02	ME_X_MW02	ES1328000003	19-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	5	16	<0.05	43,000	<0.2	<0.5	<0.1	77,000	10,600	<0.1	132	5000	<0.2	36	<1
ME_MW04	ME_MW04	ES1328003004	18-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	4	<50	<0.1	36,000	<1	2	1	86,000	11,200	<0.1	202	6000	<10	110	<1
ME_X_MW05	ME_X_MW05	ES1328001006	19-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	3.4	22	0.08	25,000	<0.2	<0.5	<0.1	61,000	9680	<0.1	109	8000	<0.2	42	<1
ME_X_MW06	ME_X_MW06	ES1328000004	19-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	6.4	17	<0.05	36,000	<0.2	<0.5	<0.1	68,000	12,600	<0.1	153	5000	<0.2	22	<1
MI_X_5/D5	MP-GM-5/D5	ES1328000001	19-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	0.6	49	0.09	136,000	<0.2	4.6	0.1	135,000	20,300	<0.1	115	12,000	<0.2	49	<1

Statistical Summary	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6		
Number of Results	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6		
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	5	3	6	0	2	2	6	6	0	6	6	0	6	0
Minimum Concentration	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	0.6	16	<0.05	25000	<0.2	<0.5	<0.1	61000	9090	<0.1	80.5	5000	<0.2	18	<1	
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.6	16	0.08	25000	ND	2	0.1	61000	9090	ND	80.5	5000	ND	18	ND	
Maximum Concentration	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	6.4	<50	0.13	136000	<1	4.6	1	135000	20300	<0.1	202	12000	<10	110	<1	
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.4	49	0.13	136000	ND	4.6	1	135000	20300	ND	202	12000	ND	110	ND	
Average Concentration	10	25	50	25	25	10	10	50	50	50	50	50	50	50	0.5	1	1	1	1	1	0.5	3.5	25	0.067	55333	0.17	1.3	0.22	85500	12245	0.05	132	7500	0.92	46	0.5	
Median Concentration	10	25	50	25	25	10	10	50	50	50	50	50	50	50	0.5	1	1	1	1	1	0.5	3.7	20	0.065	39500	0.1	0.25	0.05	81500	10900	0.05	123.5	7000	0.1	39	0.5	
Standard Deviation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.1	12	0.041	40810	0.16	1.8	0.38	26190	4131	0	42	2739	2	33	0	
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	6	6	6	0	1	6	0	
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	6	6	6	0	0	6	0	

- Comments
- #1 WHO (2011) DWQ
  - #2 RIVM 2001 (Human-toxicological SRC GW) V Chlorinated Hydrocarbons
  - #3 NHMRC 2011 ADWG Health (value for dichloromethane)
  - #4 NHMRC 2011 ADWG Health (total 1,2-dichloroethene)
  - #5 Guidelines for Managing Risk in Recreational Waters (2008) (GMRRW)
  - #6 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 8m+
  - #7 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 4-<8 m
  - #8 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 2-<4 m
  - #9 ASC NEPM (2013) HSL for Intrusive Maint Workers 2m -8m+
  - #10 ASC NEPM (2013) GIL - Fresh Waters
  - #11 ASC NEPM (2013) GIL - Drinking Water







Table 5e. AEC - ME Water Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	Halogenated Hydrocarbons					Solvents					Polychlorinated Biphenyls	Inorganics													
	1,2-dibromoethane	Bromomethane	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane	Methyl Ethyl Ketone	2-hexanone (MBK)	4-Methyl-2-pentanone	Carbon disulfide	Vinyl acetate		PCBs (Sum of total)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Carbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ferrous Iron	Fluoride	Ionic Balance	ORP	Sodium (Filtered)	Sulphate (Filtered)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	mg/L	meq/L	meq/L	mg/L	µg/L	mg/L	%	mV	mg/L	mg/L	mg/L
EQL	5	50	50	5	50	50	50	50	5	50	1	1	1	1000	1	0.01	0.01	1	50	0.1	0.01		1	1	1
Vapour Intrusion - Commercial Worker - 2-<4 m																									
Vapour Intrusion - Commercial Worker - 4-<8 m																									
Vapour Intrusion - Commercial Worker - 8 m+																									
Vapour Intrusion - Intrusive Maint Worker 2m -8m+																									
Drinking Water	1 <sup>#11</sup>	1 <sup>#11</sup>																							
Ecological (Freshwater)																									
Recreational	10 <sup>#5</sup>	10 <sup>#5</sup>																							

Location Code	Field ID	SampleCode	Sampled Date	1,2-dibromoethane	Bromomethane	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane	Methyl Ethyl Ketone	2-hexanone (MBK)	4-Methyl-2-pentanone	Carbon disulfide	Vinyl acetate	PCBs (Sum of total)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Carbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ferrous Iron	Fluoride	Ionic Balance	ORP	Sodium (Filtered)	Sulphate (Filtered)	Sulphate as S (Filtered)
ME_X_MW01	ME_X_MW01	ES1328000002	19-Dec-13	-	-	-	-	-	-	-	-	-	-	-	356	<1	<1000	356	12.8	12.4	119	1970	0.1	1.58	4.4	52	110	-
ME_X_MW02	ME_X_MW02	ES1328000003	19-Dec-13	-	-	-	-	-	-	-	-	-	-	-	410	<1	<1000	410	11	10.3	58	17,400	0.1	3.15	-51.2	39	55	-
ME_MW04	ME_MW04	ES1328003004	18-Dec-13	-	-	-	-	-	-	-	-	-	-	-	314	<1	<1000	314	12.5	11.9	119	15,800	0.1	2.29	6.4	65	137	-
ME_X_MW05	ME_X_MW05	ES1328001006	19-Dec-13	-	-	-	-	-	-	-	-	-	-	-	283	<1	<1000	283	8.67	8.58	44	4510	0.1	0.55	26.1	38	-	85
ME_X_MW06	ME_X_MW06	ES1328000004	19-Dec-13	-	-	-	-	-	-	-	-	-	-	-	329	<1	<1000	329	9.28	9.09	57	16,700	0.1	1.1	-44.2	36	53	-
ML_X_5/D5	MP-GM-5/D5	ES1328000001	19-Dec-13	<5	<50	<50	<5	<50	<50	<50	<50	<5	<50	<1	427	<1	<1000	427	24.1	22.2	189	740	0.1	4.01	91.1	93	492	-

Statistical Summary	1,2-dibromoethane	Bromomethane	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane	Methyl Ethyl Ketone	2-hexanone (MBK)	4-Methyl-2-pentanone	Carbon disulfide	Vinyl acetate	PCBs (Sum of total)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Carbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ferrous Iron	Fluoride	Ionic Balance	ORP	Sodium (Filtered)	Sulphate (Filtered)	Sulphate as S (Filtered)	
Number of Results	1	1	1	1	1	1	1	1	1	1	1	6	6	6	6	6	6	6	6	6	6	6	6	6	5	1
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	6	0	0	6	6	6	6	6	6	6	6	6	6	5	1
Minimum Concentration	<5	<50	<50	<5	<50	<50	<50	<50	<5	<50	<1	283	<1	<1000	283	8.67	8.58	44	740	0.1	0.55	-51.2	36	53	85	
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	283	ND	ND	283	8.67	8.58	44	740	0.1	0.55	ND	36	53	85	
Maximum Concentration	<5	<50	<50	<5	<50	<50	<50	<50	<5	<50	<1	427	<1	<1000	427	24.1	22.2	189	17400	0.1	4.01	91.1	93	492	85	
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	427	ND	ND	427	24.1	22.2	189	17400	0.1	4.01	91.1	93	492	85	
Average Concentration												353	0.5	500	353	13	12	98	9520	0.1	2.1	5.4	54	169		
Median Concentration	2.5	25	25	2.5	25	25	25	25	2.5	25	0.5	342.5	0.5	500	342.5	11.75	11.1	88.5	10155	0.1	1.935	5.4	45.5	110	85	
Standard Deviation												56	0	0	56	5.7	5	55	7903	0	1.3	52	22	184		
Number of Guideline Exceedances	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances (Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments

- #1 WHO (2011) DWQ
- #2 RIVM 2001 (Human-toxicological SRC GW) V Chlorinated Hydrocarbons
- #3 NHMRC 2011 ADWG Health (value for dichloromethane)
- #4 NHMRC 2011 ADWG Health (total 1,2-dichloroethene)
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- #7 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 4-<8 m
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- #9 ASC NEPM (2013) HSL for Intrusive Maint Workers 2m -8m+
- #10 ASC NEPM (2013) GIL - Fresh Waters
- #11 ASC NEPM (2013) GIL - Drinking Water















Table 5h. AEC - MH Water Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	TRH										BTEX							Metals																
	TRH > C6-C9 Fraction	TRH > C10-C14 Fraction	TRH > C15-C28 Fraction	TRH > C29-C36 Fraction	TRH > C10-C36 Fraction	TRH > C6-C10 Fraction	TRH > C6-C10 less BTEX (F1)	TRH > C10-C16 Fraction	TRH > C10-C16 less Naphthalene (F2)	TRH > C16-C34 Fraction	TRH > C34-C40 Fraction	TRH > C10-C40 Fraction	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Total BTEX	Arsenic	Boron	Cadmium	Calcium	Chromium (III+VI)	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Zinc
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
EQL	20	50	100	50	50	20	100	100	100	100	100	1	2	2	2	2	2	1	0.2	5	0.05	1000	0.2	0.5	50	0.1	1000	0.5	0.1	0.5	1000	0.2	1	
Vapour Intrusion - Commercial Worker - 2-<4 m							6200 <sup>#8</sup>		NL <sup>#8</sup>			4900 <sup>#8</sup>	NL <sup>#8</sup>	NL <sup>#8</sup>			NL <sup>#8</sup>																	
Vapour Intrusion - Commercial Worker - 4-<8 m							6300 <sup>#7</sup>		NL <sup>#7</sup>			5100 <sup>#7</sup>	NL <sup>#7</sup>	NL <sup>#7</sup>			NL <sup>#7</sup>																	
Vapour Intrusion - Commercial Worker - 8 m+							6500 <sup>#6</sup>		NL <sup>#6</sup>			5400 <sup>#6</sup>	NL <sup>#6</sup>	NL <sup>#6</sup>			NL <sup>#6</sup>																	
Vapour Intrusion - Intrusive Maint Worker 2m -8m+							NL <sup>#9</sup>		NL <sup>#9</sup>			NL <sup>#9</sup>	NL <sup>#9</sup>	NL <sup>#9</sup>			NL <sup>#9</sup>																	
Drinking Water												1 <sup>#11</sup>	800 <sup>#11</sup>	300 <sup>#11</sup>			600 <sup>#11</sup>		10 <sup>#11</sup>	4000 <sup>#11</sup>	2 <sup>#11</sup>		50 <sup>#11</sup>	2000 <sup>#11</sup>		10 <sup>#11</sup>	500 <sup>#2</sup>	1 <sup>#2</sup>	20 <sup>#11</sup>		10 <sup>#11</sup>			
Ecological (Freshwater)																			13 <sup>#10</sup>	370 <sup>#10</sup>	0.2 <sup>#10</sup>		1 <sup>#10</sup>	1.4 <sup>#10</sup>		3.4 <sup>#10</sup>	1900 <sup>#10</sup>	0.06 <sup>#10</sup>	11 <sup>#10</sup>		5 <sup>#10</sup>	8 <sup>#10</sup>		
Recreational												10 <sup>#5</sup>	8000 <sup>#5</sup>	3000 <sup>#5</sup>			6000 <sup>#5</sup>		100 <sup>#5</sup>	40000 <sup>#5</sup>	20 <sup>#5</sup>		500 <sup>#5</sup>	20000 <sup>#5</sup>		100 <sup>#5</sup>	5000 <sup>#5</sup>	10 <sup>#5</sup>	200 <sup>#5</sup>		100 <sup>#5</sup>			

Location Code	Field ID	SampleCode	Sampled Date	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<2	<1	1	150	0.8	168,000	2	4	-	<1	104,000	-	<0.1	312	27,000	-	440
MH_MW01	MH_MW01	ES1327849001	17-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<2	<1	1	150	0.8	168,000	2	4	-	<1	104,000	-	<0.1	312	27,000	-	440
MH_MW02	MH_MW02	ES1327569002	16-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<2	<1	0.7	39	<0.05	22,000	<0.2	<0.5	-	0.1	11,000	354	<0.1	31.4	10,000	<0.2	57
MH_MW03	MH_MW03	ES1327849005	17-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<2	<1	1	2160	0.6	254,000	<1	2	-	2	207,000	-	<0.1	990	48,000	-	802
MH_X_4/D8	MH_X_4/D8	ES1327988001	18-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<2	<1	<1	100	0.6	88,000	<1	1	-	<1	68,000	3960	<0.1	218	7000	<10	153
MH_X_D15	MH_X_D15	ES1324232006	06-Nov-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<2	<1	<1	190	1.2	177,000	<1	20	21,400	22	79,000	1710	<0.1	887	30,000	<10	2300
MH_X_D17	MH_X_D17	ES1324556001	08-Nov-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<2	<1	8	<50	<0.1	157,000	<1	<1	9120	<1	79,000	936	<0.1	14	15,000	<10	51
MH_X_D18	MH_X_D18	ES1324232004	06-Nov-13	<20	<50	390	680	1070	<20	<20	<100	<100	730	820	1550	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1	10	90	<0.1	77,000	<1	<1	3030	<1	31,000	144	<0.1	4	19,000	<10	<5
MH_X_D19	MH_X_D19	ES1324556002	08-Nov-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<2	<1	<1	2170	0.4	-	<1	<1	18,800	<1	-	14,600	<0.1	762	-	<10	355
MH_SS01 <sup>#12</sup>	MH_SS01_W <sup>#12</sup>	ES1400192001	19-Dec-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	80	<0.1	15,000	<1	<1	-	<1	4000	214	<0.1	1	6000	<10	<5	

Statistical Summary				8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	9	9	9	8	9	9	4	9	8	7	9	9	8	7	9
Number of Results	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	9	9	9	8	9	9	4	9	8	7	9	9	8	7	9	
Number of Detects	0	0	1	1	1	0	0	0	0	1	1	1	0	0	0	0	0	0	6	8	5	8	1	4	4	3	8	7	0	9	8	0	7	
Minimum Concentration	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	0.7	39	<0.05	15000	<0.2	<0.5	3030	0.1	4000	144	<0.1	1	6000	<0.2	<5
Minimum Detect	ND	ND	390	680	1070	ND	ND	ND	ND	730	820	1550	ND	ND	ND	ND	ND	ND	0.7	39	0.4	15000	2	1	3030	0.1	4000	144	ND	1	6000	ND	51	
Maximum Concentration	<20	<50	390	680	1070	<20	<20	<100	<100	730	820	1550	<1	<2	<2	<2	<2	<2	<1	10	2170	1.2	254000	2	20	21400	22	207000	14600	<0.1	990	48000	<10	2300
Maximum Detect	ND	ND	390	680	1070	ND	ND	ND	ND	730	820	1550	ND	ND	ND	ND	ND	ND	10	2170	1.2	254000	2	20	21400	22	207000	14600	ND	990	48000	ND	2300	
Average Concentration	10	25	93	107	156	10	10	50	50	135	146	238	0.5	1	1	1	1	1	0.5	2.6	556	0.42	119750	0.62	3.3	13088	3	72875	3131	0.05	358	20250	4.3	463
Median Concentration	10	25	50	25	25	10	10	50	50	50	50	50	0.5	1	1	1	1	1	0.5	1	100	0.4	122500	0.5	0.5	13960	0.5	73500	936	0.05	218	17000	5	153
Standard Deviation	0	0	120	232	369	0	0	0	0	240	272	530	0	0	0	0	0	0	0	3.7	914	0.42	83135	0.53	6.4	8537	7.1	64789	5231	0	410	14260	1.9	738
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	5	0	1	3	0	1	0	4	9	7	0	6	7	
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	5	0	1	3	0	1	0	4	0	7	0	0	7	

**Comments**

#1 WHO (2011) DWQ

#2 RIVM 2001 (Human-toxicological SRC GW) V Chlorinated Hydrocarbons

#3 NHMRC 2011 ADWG Health (value for dichloromethane)

#4 NHMRC 2011 ADWG Health (total 1,2-dichloroethene)

#5 Guidelines for Managing Risk in Recreational Waters (2008) (GMRRW)

#6 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 8m+

#7 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 4-<8 m

#8 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 2-<4 m

#9 ASC NEPM (2103) HSL for Intrusive Maint Workers 2m -8m+

#10 ASC NEPM (2103) GIL - Fresh Waters

#11 ASC NEPM (2103) GIL - Drinking Water

#12 Sample collected from surface water in a pond to the south of the coal washery ponds. This sample was not field filtered and these results are total metals.

	Field				Inorganics													
	Dissolved Oxygen (Filtered)	EC (field)	pH (Field)	Temp	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Carbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ferrous Iron	Fluoride	% Ionic Balance	ORP	Sodium (Filtered)	Sulphate (Filtered)	Sulphate as S (Filtered)
	mg/L	µS/cm	pH Units	oC	mg/L	mg/L	µg/L	mg/L	meq/L	meq/L	mg/L	µg/L	mg/L	%	mV	mg/L	mg/L	mg/L
EQL					1	1	1000	1	0.01	0.01	1	50	0.1	0.01		1	1	1
Vapour Intrusion - Commercial Worker - 2-<4 m																		
Vapour Intrusion - Commercial Worker - 4-<8 m																		
Vapour Intrusion - Commercial Worker - 8 m+																		
Vapour Intrusion - Intrusive Maint Worker 2m -8m+																		
Drinking Water																		
Ecological (Freshwater)																		
Recreational																		

Location Code	Field ID	SampleCode	Sampled Date	Dissolved Oxygen (Filtered)	EC (field)	pH (Field)	Temp	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Carbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ferrous Iron	Fluoride	% Ionic Balance	ORP	Sodium (Filtered)	Sulphate (Filtered)	Sulphate as S (Filtered)
MH_MW01	MH_MW01	ES1327849001	17-Dec-13	0.17	1778	5.89	17.6	92	<1	<1000	92	26	26.7	68	860	<0.1	1.22	123.2	208	1070	-
MH_MW02	MH_MW02	ES1327569002	16-Dec-13	0.2	220.6	6.06	17.7	87	<1	<1000	87	2.51	2.87	14	2500	<0.1	-	-13	14	-	18
MH_MW03	MH_MW03	ES1327849005	17-Dec-13	0.28	3447	5.79	18.5	81	<1	<1000	81	52.7	54.4	335	34900	<0.1	1.59	61.9	540	2000	-
MH_X_4/D8	MH_X_4/D8	ES1327988001	18-Dec-13	0.47	1000	5.53	17.4	34	<1	<1000	34	12.2	12.6	60	320	<0.1	1.8	172.7	57	472	-
MH_X_D15	MH_X_D15	ES1324232006	06-Nov-13	0.47	2190	4.24	24.5	<1	<1	<1000	<1	27.3	27.5	76	-	<0.1	0.29	250.2	262	1210	-
MH_X_D17	MH_X_D17	ES1324556001	08-Nov-13	0.02	1659	6.6	32.9	123	<1	<1000	123	16.2	16.8	38	-	0.4	1.64	-2.4	47	610	-
MH_X_D18	MH_X_D18	ES1324232004	06-Nov-13	0.07	633	6.91	21.4	339	<1	<1000	339	7.4	7.53	9	-	0.8	0.88	-126.7	15	18	-
MH_X_D19	MH_X_D19	ES1324556002	08-Nov-13	0.96	3753	5.93	18.8	-	-	-	-	-	-	-	-	-	-	18.1	-	-	-
MH_SS01 #12	MH_SS01_W #12	ES1400192001	19-Dec-13	-	-	-	-	76	<1	<1000	76	2.17	1.88	7	-	0.2	-	-	15	22	-

**Statistical Summary**

Number of Results	8	8	8	8	8	8	8	8	8	8	8	8	8	4	8	6	8	8	7	1
Number of Detects	8	8	8	8	7	0	0	7	8	8	8	8	4	3	6	8	8	7	1	
Minimum Concentration	0.02	220.6	4.24	17.4	<1	<1	<1000	<1	2.17	1.88	7	320	<0.1	0.29	-126.7	14	18	18		
Minimum Detect	0.02	220.6	4.24	17.4	34	ND	ND	34	2.17	1.88	7	320	0.2	0.29	ND	14	18	18		
Maximum Concentration	0.96	3753	6.91	32.9	339	<1	<1000	339	52.7	54.4	335	34900	0.8	1.8	250.2	540	2000	18		
Maximum Detect	0.96	3753	6.91	32.9	339	ND	ND	339	52.7	54.4	335	34900	0.8	1.8	250.2	540	2000	18		
Average Concentration	0.33	1835	5.9	21	104	0.5	500	104	18	19	76	9645	0.21	1.2	61	145	772	18		
Median Concentration	0.24	1718.5	5.91	18.65	84	0.5	500	84	14.2	14.7	49	1680	0.05	1.405	40	52	610	18		
Standard Deviation	0.3	1264	0.8	5.4	102	0	0	102	17	17	108	16862	0.27	0.57	119	186	711	18		
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**Comments**

- #1 WHO (2011) DWQ
- #2 RIVM 2001 (Human-toxicological SRC GW) V Chlorinated Hydrocarbons
- #3 NHMRC 2011 ADWG Health (value for dichloromethane)
- #4 NHMRC 2011 ADWG Health (total 1,2-dichloroethene)
- #5 Guidelines for Managing Risk in Recreational Waters (2008) (GMRRW)
- #6 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 8m+
- #7 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 4-<8 m



Table 5j. AEC - MJ Water Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	TRH										BTEX						Metals																						
	TRH > C6-C9 Fraction	TRH > C10-C14 Fraction	TRH > C15-C28 Fraction	TRH > C29-C36 Fraction	TRH > C10-C36 Fraction	TRH > C6-C10 Fraction	TRH > C6-C10 less BTEX (F1)	TRH > C10-C16 Fraction	TRH > C10-C16 less Naphthalene (F2)	TRH > C16-C34 Fraction	TRH > C34-C40 Fraction	TRH > C10-C40 Fraction	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Total BTEX	Arsenic	Boron	Cadmium	Calcium	Chromium (III+VI)	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium (Filtered)	Selenium	Zinc	Acenaphthene	Acenaphthylene	Anthracene		
EQI	20	50	100	50	50	20	20	100	100	100	100	1	2	2	2	2	2	1	0.2	5	0.05	1000	0.2	0.5	50	0.1	1000	0.5	0.1	0.5	1000	0.2	1	1	1	1	1		
Vapour Intrusion - Commercial Worker - 2-<4 m							NL	NL				4900	NL	NL			NL																						
Vapour Intrusion - Commercial Worker - 4-<8 m							NL	NL				5100	NL	NL			NL																						
Vapour Intrusion - Commercial Worker - 8 m+							NL	NL				5400	NL	NL			NL																						
Vapour Intrusion - Intrusive Maint Worker 2m -8m+							NL	NL				NL	NL	NL			NL																						
Drinking Water												1	800	300			600		10	4000	2		50	2000		10		500	1	20		10							
Ecological (Freshwater)																			13	370	0.2		1	1.4		3.4		1900	0.06	11		5	8						
Recreational												10	8000	3000			6000		100	40,000	20		500	20000		100		5000	10	200		100							

SampleCode	WellCode	LocCode	Sample Date	70	<50	<100	<50	<50	70	50	<100	<100	<100	<100	<100	<100	2	4	<2	9	6	15	21	7	60	<0.1	2000	<1	2	-	1	1000	288	<0.1	12	14,000	<10	11	<1	<1	<1
ES1321739001	MJ_X_MWMP1	MJ_X_MWMP1	03-Oct-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<1	4	60	<0.1	10,000	<1	3	-	<1	5000	917	<0.1	15	9000	<10	84	<1	<1	<1
ES1321739002	MJ_X_MWMP2	MJ_X_MWMP2	03-Oct-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<1	15	<50	<0.1	9000	<1	<1	-	<1	6000	354	<0.1	25	11,000	<10	12	<1	<1	<1
ES1323856003	MJ_X_MWMP3	MJ_X_MWMP3	03-Oct-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<1	3	<50	<0.1	11,000	<1	3	1420	<1	4000	465	<0.1	18	14,000	<10	42	<1	<1	<1
ES1323856004	MJ_X_MWMP4	MJ_X_MWMP4	31-Oct-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<1	28	<50	<0.1	35,000	<1	2	24,200	<1	26,000	1510	<0.1	78	14,000	<10	48	<1	<1	<1
ES1323856005	MJ_X_MWMP5	MJ_X_MWMP5	31-Oct-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<1	17	<50	<0.1	36,000	<1	26	15,000	<1	35,000	1940	<0.1	100	12,000	<10	109	<1	<1	<1
ES1328002005	MJ_X_MWMP6	MJ_X_MWMP6	31-Oct-13	<20	90	<100	<50	90	<20	<20	100	100	<100	<100	100	<1	<2	<2	<2	<2	<2	<2	<1	8.6	18	0.06	33,000	0.8	1.6	-	0.1	40,000	4660	<0.1	134	6000	1.3	117	<1	<1	<1
ES1328041003	MJ_X_MWMP6	MJ_X_MWMP6	17-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<1	1	110	<0.1	32,000	<1	<1	-	<1	10,000	1450	<0.1	5	15,000	<10	14	<1	<1	<1

Statistical Summary

Number of Results	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	3	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Number of Detects	1	1	0	0	1	1	1	1	1	0	0	1	1	1	0	1	1	1	1	1	1	1	1	8	4	1	8	1	6	3	2	8	8	0	8	8	1	8	0	0	0	
Minimum Concentration	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<1	1	18	0.06	2000	0.8	<1	1420	0.1	1000	288	<0.1	5	6000	1.3	11	<1	<1	<1		
Maximum Concentration	70	90	<100	<50	90	70	50	100	100	<100	<100	100	2	4	<2	9	6	15	21	28	110	<0.1	36000	<1	26	24200	1	40000	4660	<0.1	134	15000	<10	117	<1	<1	<1	<1				
Average Concentration	18	33	50	25	33	18	15	56	56	50	50	56	0.69	1.4	1	2	1.6	2.8	3.1	10	44	0.051	21000	0.54	4.8	13540	0.51	15875	1448	0.05	48	11875	4.5	55	0.5	0.5	0.5	0.5				
Median Concentration	10	25	50	25	25	10	10	50	50	50	50	50	0.5	1	1	1	1	1	0.5	7.8	25	0.05	21500	0.5	2	15000	0.5	8000	1183.5	0.05	21.5	13000	5	45	0.5	0.5	0.5					
Standard Deviation	21	23	0	0	23	21	14	18	18	0	0	18	0.53	1.1	0	2.8	1.8	4.9	7.2	9.1	32	0.0035	14203	0.11	8.6	11460	0.24	15413	1432	0	49	3091	1.3	44	0	0	0					
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	5	8	7	0	7	8	0	0	0					
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	6	0	0	0	5	0	7	0	0	8	0	0	0		









Table 5j. AEC - MJ Water Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	Solvents					Polychlorinated Biphenyls	Inorganics													
	Methyl Ethyl Ketone	2-hexanone (MBK)	4-Methyl-2-pentanone	Carbon disulfide	Vinyl acetate		PCBs (Sum of total)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Carbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ferrous Iron	Fluoride	Ionic Balance	ORP	Sodium (Filtered)	Sulphate (Filtered)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	mg/L	meq/L	meq/L	mg/L	µg/L	mg/L	%	mV	mg/L	mg/L	mg/L
EQL	50	50	50	5	50	1	1	1	1000	1	0.01	0.01	1	50	0.1	0.01		1	1	1
Vapour Intrusion - Commercial Worker - 2-<4 m																				
Vapour Intrusion - Commercial Worker - 4-<8 m																				
Vapour Intrusion - Commercial Worker - 8 m+																				
Vapour Intrusion - Intrusive Maint Worker 2m -8m+																				
Drinking Water																				
Ecological (Freshwater)																				
Recreational																				

SampleCode	WellCode	LocCode	Sample Date	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	mg/L	meq/L	meq/L	mg/L	µg/L	mg/L	%	mV	mg/L	mg/L	mg/L
ES1321739001	MJ_X_MWMP1	MJ_X_MWMP1	03-Oct-13	<50	<50	<50	<5	<50	-	-	50	<1	<1000	50	1.74	1.67	7	<50	0.2	-	-8.7	26	-	26
ES1321739002	MJ_X_MWMP2	MJ_X_MWMP2	03-Oct-13	<50	<50	<50	<5	<50	-	-	74	<1	<1000	74	2.87	2.49	13	11,700	0.2	-	28.8	31	-	49
ES1321739003	MJ_X_MWMP3	MJ_X_MWMP3	03-Oct-13	<50	<50	<50	<5	<50	-	-	78	<1	<1000	78	1.9	1.88	9	400	0.3	-	-80.1	15	-	4
ES1323856003	MJ_X_MWMP4	MJ_X_MWMP4	31-Oct-13	-	-	-	-	-	-	-	62	<1	<1000	62	1.81	1.67	4	-	0.1	-	87.1	10	22	-
ES1323856004	MJ_X_MWMP5	MJ_X_MWMP5	31-Oct-13	-	-	-	-	-	-	-	270	<1	<1000	270	7.56	7.81	42	-	0.1	1.63	-4.4	82	47	-
ES1323856005	MJ_X_MWMP6	MJ_X_MWMP6	31-Oct-13	-	-	-	-	-	-	-	210	<1	<1000	210	8.45	8.51	43	-	<0.1	0.33	28.9	81	146	-
ES1328002005	MK_MW09	MK_SB42	18-Dec-13	<50	<50	<50	<5	<50	<1	<1	225	<1	<1000	225	13.4	13	282	86,200	<0.1	1.67	2.7	135	-	46
ES1328041003	MD_MW01	MD_MW01	17-Dec-13	<50	<50	<50	<5	<50	-	-	102	<1	<1000	102	4.15	4.2	13	4400	0.1	0.5	-45.6	32	84	-

Statistical Summary																								
	5	5	5	5	5	1	8	8	8	8	8	8	8	8	8	8	5	8	4	8	8	4	4	
Number of Results	5	5	5	5	5	1	8	8	8	8	8	8	8	8	8	8	5	8	4	8	8	4	4	
Number of Detects	0	0	0	0	0	0	8	0	0	8	8	8	8	8	8	8	4	6	4	8	8	4	4	
Minimum Concentration	<50	<50	<50	<5	<50	<1	50	<1	<1000	50	1.74	1.67	4	<50	<0.1	0.33	-80.1	10	22	4				
Maximum Concentration	<50	<50	<50	<5	<50	<1	270	<1	<1000	270	13.4	13	282	86200	0.3	1.67	87.1	135	146	49				
Average Concentration	25	25	25	2.5	25	0.5	134	0.5	500	134	5.2	5.2	52	20545	0.14	1	1.1	52	75	31				
Median Concentration	25	25	25	2.5	25	0.5	90	0.5	500	90	3.51	3.345	13	4400	0.1	1.065	-0.85	31.5	65.5	36				
Standard Deviation	0	0	0	0	0	0.5	87	0	0	87	4.2	4.2	94	37001	0.088	0.72	50	44	54	21				
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	



Table 5k. AEC - MK Water Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	TRH										BTEX						Metals																
	TRH > C6-C9 Fraction	TRH > C10-C14 Fraction	TRH > C15-C28 Fraction	TRH > C29-C36 Fraction	TRH > C10-C36 Fraction	TRH > C6-C10 Fraction	TRH > C6-C10 less BTEX (F1)	TRH > C10-C16 Fraction	TRH > C10-C16 less Naphthalene (F2)	TRH > C16-C34 Fraction	TRH > C34-C40 Fraction	TRH > C10-C40 Fraction	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Total BTEX	Arsenic	Boron	Cadmium	Calcium	Chromium (III+VI)	Copper	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Zinc
EQI	20	50	100	50	50	20	20	100	100	100	100	1	2	2	2	2	2	1	0.2	5	0.05	1000	0.2	0.5	0.1	1000	0.5	0.1	0.5	1000	0.2	1	1
Vapour Intrusion - Commercial Worker - 2-<4 m						6200 <sup>#8</sup>		NL <sup>#8</sup>				4900 <sup>#8</sup>	NL <sup>#8</sup>	NL <sup>#8</sup>			NL <sup>#8</sup>																
Vapour Intrusion - Commercial Worker - 4-<8 m						6300 <sup>#7</sup>		NL <sup>#7</sup>				5100 <sup>#7</sup>	NL <sup>#7</sup>	NL <sup>#7</sup>			NL <sup>#7</sup>																
Vapour Intrusion - Commercial Worker - 8 m+						6500 <sup>#6</sup>		NL <sup>#6</sup>				5400 <sup>#6</sup>	NL <sup>#6</sup>	NL <sup>#6</sup>			NL <sup>#6</sup>																
Vapour Intrusion - Intrusive Maint Worker 2m -8m+						NL <sup>#9</sup>		NL <sup>#9</sup>				NL <sup>#9</sup>	NL <sup>#9</sup>	NL <sup>#9</sup>			NL <sup>#9</sup>																
Drinking Water												1 <sup>#11</sup>	800 <sup>#11</sup>	300 <sup>#11</sup>			600 <sup>#11</sup>		10 <sup>#11</sup>	400 <sup>#11</sup>	2 <sup>#11</sup>		50 <sup>#11</sup>	2000 <sup>#11</sup>	10 <sup>#11</sup>		500 <sup>#2</sup>	1 <sup>#2</sup>	20 <sup>#11</sup>		10 <sup>#11</sup>		
Ecological (Freshwater)																			13 <sup>#10</sup>	370 <sup>#10</sup>	0.2 <sup>#10</sup>		1 <sup>#10</sup>	1.4 <sup>#10</sup>	3.4 <sup>#10</sup>		1900 <sup>#10</sup>	0.06 <sup>#10</sup>	11 <sup>#10</sup>		5 <sup>#10</sup>	8 <sup>#10</sup>	
Recreational												10 <sup>#5</sup>	8000 <sup>#5</sup>	3000 <sup>#5</sup>			6000 <sup>#5</sup>		100 <sup>#5</sup>	40000 <sup>#5</sup>	20 <sup>#5</sup>		500 <sup>#5</sup>	20000 <sup>#5</sup>	100 <sup>#5</sup>		5000 <sup>#5</sup>	10 <sup>#5</sup>	200 <sup>#5</sup>		100 <sup>#5</sup>		

Location Code	Field ID	SampleCode	Sampled Date	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	0.5	18	0.52	29,000	<0.2	1.2	<0.1	14,000	786	<0.1	42.8	10,000	<0.2	37	<1
MK_SB16	MK_MW01	ES1328002006	18-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	0.4	17	0.11	20,000	0.2	0.6	40.3	9000	1440	<0.1	52.5	7000	0.2	102	<1
MK_SB25	MK_MW10	ES1327997001	19-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	13	<50	<0.1	50,000	<1	<1	<1	23,000	1030	<0.1	9	10,000	<10	8	<1
MK_SB39	MK_MW02	ES1328002002	18-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	3	21	0.23	20,000	0.2	<0.5	2.3	50,000	12,600	<0.1	346	10,000	<0.2	454	<1
MK_SB42	MK_MW09	ES1328002005	18-Dec-13	<20	90	<100	<50	90	<20	<20	100	100	<100	<100	100	<1	<2	<2	<2	<2	<2	<1	8.6	18	0.06	33,000	0.8	1.6	0.1	40,000	4660	<0.1	134	6000	1.3	117	<1
MK_SB51	MK_MW05	ES1328001001	19-Dec-13	<20	<50	150	<50	150	<20	<20	<100	<100	170	<100	170	<1	<2	<2	<2	<2	<2	<1	<1	<50	<0.1	40,000	<1	<1	<1	20,000	1090	<0.1	28	13,000	<10	13	<1
MK_SB65	MK_MW11	ES1328002004	18-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	39.7	22	0.07	41,000	<0.2	1.3	<0.1	32,000	4460	<0.1	184	11,000	<0.2	242	<1
MK_SB68	MK_MW03	ES1328002001	18-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	2.8	29	0.08	40,000	<0.2	<0.5	0.5	88,000	18,500	<0.1	277	10,000	<0.2	199	<1
MK_SB76	MK_MW06	ES1328001005	19-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	12.5	36	0.5	42,000	<0.2	1.4	0.7	46,000	5400	<0.1	276	12,000	<0.2	70	<1
MK_SB78	MK_MW08	ES1328001004	19-Dec-13	<20	-	-	-	-	<20	<20	-	-	-	-	-	<1	<2	<2	<2	<2	<2	<1	2.5	34	0.12	-	0.2	2.8	9.2	-	4570	<0.1	174	-	<0.2	50	-
MK_SB87	MK_MW04	ES1328001002	19-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	<1	<50	<0.1	26,000	<1	<1	<1	17,000	2910	<0.1	18	9000	<10	5	<1

Statistical Summary

Number of Results	11	10	10	10	10	11	11	10	10	10	10	10	10	10	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	11	11	10	11	11	11	10	11	11	10
Number of Detects	0	1	1	0	2	0	0	1	1	1	0	2	0	0	0	0	0	0	0	0	0	9	8	8	10	4	6	6	10	11	0	11	10	2	11	0	0	0	0	
Minimum Concentration	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1	0.4	17	0.06	20000	<0.2	<0.5	<0.1	9000	786	<0.1	9	6000	<0.2	5	<1	<1	<1	<1	<1		
Minimum Detect	ND	90	150	ND	90	ND	ND	100	100	170	ND	100	ND	ND	ND	ND	ND	ND	0.4	17	0.06	20000	0.2	0.6	0.1	9000	786	ND	9	6000	0.2	5	ND	ND	ND	ND	ND			
Maximum Concentration	<20	90	150	<50	150	<20	<20	100	100	170	<100	170	<1	<2	<2	<2	<2	<1	39.7	<50	0.52	50000	<1	2.8	40.3	88000	18500	<0.1	346	13000	<10	454	<1	<1	<1	<1	<1	<1		
Maximum Detect	ND	90	150	ND	150	ND	ND	100	100	170	ND	170	ND	ND	ND	ND	ND	ND	39.7	36	0.52	50000	0.8	2.8	40.3	88000	18500	ND	346	13000	1.3	454	ND	ND	ND	ND	ND			
Average Concentration	10	32	60	25	44	10	10	55	55	62	50	67	0.5	1	1	1	1	1	0.5	7.6	25	0.17	34100	0.3	0.99	5	33900	5222	0.05	140	9800	1.6	118	0.5	0.5	0.5	0.5	0.5		
Median Concentration	10	25	50	25	25	10	10	50	50	50	50	50	0.5	1	1	1	1	1	0.5	2.8	25	0.08	36500	0.2	0.6	0.5	27500	4460	0.05	134	10000	0.1	70	0.5	0.5	0.5	0.5	0.5		
Standard Deviation	0	21	32	0	42	0	0	16	16	38	0	39	0	0	0	0	0	0	12	6.3	0.18	10126	0.24	0.77	12	23539	5532	0	120	2098	2.2	136	0	0	0	0	0			
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	3	2	0	11	11	10	0	3	10	0	0	0	0	0	0		
Number of Guideline Exceedances (Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	3	2	0	11	0	10	0	0	10	0	0	0	0	0	0		

Comments

- #1 WHO (2011) DWQ
- #2 RIVM 2001 (Human-toxicological SRC GW) V Chlorinated Hydrocarbons
- #3 NHMRC 2011 ADWG Health (value for dichloromethane)
- #4 NHMRC 2011 ADWG Health (total 1,2-dichloroethene)
- #5 Guidelines for Managing Risk in Recreational Waters (2008) (GMRRW)
- #6 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 8m+
- #7 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 4-<8 m
- #8 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 2-<4 m
- #9 ASC NEPM (2013) HSL for Intrusive Maint Workers 2m -8m+
- #10 ASC NEPM (2013) GIL - Fresh Waters
- #11 ASC NEPM (2013) GIL - Drinking Water









Table 5k. AEC - MK Water Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	Halogenated Hydrocarbons					Solvents					Polychlorinated Biphenyls	Inorganics													
	1,2-dibromoethane	Bromomethane	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane	Methyl Ethyl Ketone	2-hexanone (MBK)	4-Methyl-2-pentanone	Carbon disulfide	Vinyl acetate	PCBs (Sum of total)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Carbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ferrous Iron	Fluoride	Ionic Balance	ORP	Sodium (Filtered)	Sulphate (Filtered)	Sulphate as S (Filtered)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	mg/L	meq/L	meq/L	mg/L	µg/L	mg/L	%	mV	mg/L	mg/L	mg/L
EQL	5	50	50	5	50	50	50	5	50	1	1	1	1000	1	0.01	0.01	1	50	0.1	0.01			1	1	1
Vapour Intrusion - Commercial Worker - 2-<4 m																									
Vapour Intrusion - Commercial Worker - 4-<8 m																									
Vapour Intrusion - Commercial Worker - 8 m+																									
Vapour Intrusion - Intrusive Maint Worker 2m -8m+																									
Drinking Water	1 <sup>#11</sup>	1 <sup>#11</sup>																							
Ecological (Freshwater)																									
Recreational	10 <sup>#5</sup>	10 <sup>#5</sup>																							

Location Code	Field ID	SampleCode	Sampled Date	1,2-dibromoethane	Bromomethane	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane	Methyl Ethyl Ketone	2-hexanone (MBK)	4-Methyl-2-pentanone	Carbon disulfide	Vinyl acetate	PCBs (Sum of total)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Carbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ferrous Iron	Fluoride	Ionic Balance	ORP	Sodium (Filtered)	Sulphate (Filtered)	Sulphate as S (Filtered)
MK_SB16	MK_MW01	ES1328002006	18-Dec-13	<5	<50	<50	<5	<50	<50	<50	<50	<5	<50	<1	160	<1	<1000	160	3.79	3.68	7	60	0.2	1.49	78.2	19	-	19
MK_SB22	MK_MW07	ES1328041007	17-Dec-13	<5	<50	<50	<5	<50	<50	<50	<50	<5	<50	<1	62	<1	<1000	62	3.71	3.57	24	60	<0.1	1.87	152.1	38	86	-
MK_SB25	MK_MW10	ES1327997001	19-Dec-13	<5	<50	<50	<5	<50	<50	<50	<50	<5	<50	<1	173	<1	<1000	173	5.15	5.34	10	70	0.5	1.77	22.4	16	68	-
MK_SB39	MK_MW02	ES1328002002	18-Dec-13	<5	<50	<50	<5	<50	<50	<50	<50	<5	<50	<1	90	<1	<1000	90	9.64	9.63	101	35,000	<0.1	0.09	1.5	55	-	240
MK_SB42	MK_MW09	ES1328002005	18-Dec-13	<5	<50	<50	<5	<50	<50	<50	<50	<5	<50	<1	225	<1	<1000	225	13.4	13	282	86,200	<0.1	1.67	2.7	135	-	46
MK_SB51	MK_MW05	ES1328001001	19-Dec-13	<5	<50	<50	<5	<50	<50	<50	<50	<5	<50	<1	96	<1	<1000	96	6.6	6.35	50	3630	0.2	1.96	18.3	54	-	157
MK_SB65	MK_MW11	ES1328002004	18-Dec-13	<5	<50	<50	<5	<50	<50	<50	<50	<5	<50	<1	196	<1	<1000	196	7.65	7.39	80	17,100	<0.1	1.73	66.8	44	-	71
MK_SB68	MK_MW03	ES1328002001	18-Dec-13	<5	<50	<50	<5	<50	<50	<50	<50	<5	<50	<1	200	<1	<1000	200	11.7	10.8	31	11,900	<0.1	4.05	81.6	29	-	326
MK_SB76	MK_MW06	ES1328001005	19-Dec-13	<5	<50	<50	<5	<50	<50	<50	<50	<5	<50	<1	131	<1	<1000	131	9.36	9.08	47	15,300	<0.1	1.53	23.6	57	-	260
MK_SB78	MK_MW08	ES1328001004	19-Dec-13	<5	<50	<50	<5	<50	<50	<50	<50	<5	<50	-	-	-	-	-	-	-	-	650	-	-	30.4	-	-	-
MK_SB87	MK_MW04	ES1328001002	19-Dec-13	<5	<50	<50	<5	<50	<50	<50	<50	<5	<50	<1	119	<1	<1000	119	5.55	5.53	38	13,700	<0.1	0.19	-34.5	55	-	101

Statistical Summary

Number of Results	11	11	11	11	11	11	11	11	11	11	11	11	11	10	10	10	10	10	10	10	10	11	10	10	11	10	2	8	
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	10	10	10	10	11	3	10	11	10	2	8	
Minimum Concentration	<5	<50	<50	<5	<50	<50	<50	<50	<50	<50	<50	<5	<50	<1	62	<1	<1000	62	3.71	3.57	7	60	<0.1	0.09	-34.5	16	68	19	
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	62	ND	ND	62	3.71	3.57	7	60	0.2	0.09	ND	16	68	19	
Maximum Concentration	<5	<50	<50	<5	<50	<50	<50	<50	<50	<50	<50	<5	<50	<1	225	<1	<1000	225	13.4	13	282	86200	0.5	4.05	152.1	135	86	326	
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	225	ND	ND	225	13.4	13	282	86200	0.5	4.05	152.1	135	86	326	
Average Concentration	2.5	25	25	2.5	25	25	25	25	25	25	25	2.5	25	0.5	145	0.5	500	145	7.7	7.4	67	16697	0.13	1.6	40	50		153	
Median Concentration	2.5	25	25	2.5	25	25	25	25	25	25	25	2.5	25	0.5	145.5	0.5	500	145.5	7.125	6.87	42.5	11900	0.05	1.7	23.6	49	77	129	
Standard Deviation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54	0	0	54	3.3	3.1	81	25413	0.15	1.1	51	33		112	
Number of Guideline Exceedances	11	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments

- #1 WHO (2011) DWQ
- #2 RIVM 2001 (Human-toxicological SRC GW) V Chlorinated Hydrocarbons
- #3 NHMRC 2011 ADWG Health (value for dichloromethane)
- #4 NHMRC 2011 ADWG Health (total 1,2-dichloroethene)
- #5 Guidelines for Managing Risk in Recreational Waters (2008) (GMRRW)
- #6 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 8m+
- #7 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 4-<8 m
- #8 ASC NEPM (2103) HSL for vapour intrusion HSL-D (Commercial/Industrial) 2-<4 m
- #9 ASC NEPM (2013) HSL for Intrusive Maint Workers 2m -8m+
- #10 ASC NEPM (2013) GIL - Fresh Waters
- #11 ASC NEPM (2013) GIL - Drinking Water



Table 5L. AEC - ML Water Chemistry Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	TRH											BTEX						Metals														
	TRH > C6-C9 Fraction	TRH > C10-C14 Fraction	TRH > C15-C28 Fraction	TRH > C29-C36 Fraction	TRH > C10-C36 Fraction	TRH > C6-C10 Fraction	TRH > C6-C10 less BTEX (F1)	TRH > C10-C16 Fraction	TRH > C10-C16 less Naphthalene (F2)	TRH > C16-C34 Fraction	TRH > C34-C40 Fraction	TRH > C10-C40 Fraction	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Total BTEX	Arsenic	Boron	Cadmium	Calcium	Chromium (III+VI)	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium (Filtered)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
EQL	20	50	100	50	50	20	20	100	100	100	100	1	2	2	2	2	2	2	1	0.2	5	0.05	1000	0.2	0.5	50	0.1	1000	0.5	0.1	0.5	1000
Vapour Intrusion - Commercial Worker - 2-<4 m						6200 <sup>#8</sup>		NL <sup>#8</sup>				4900 <sup>#8</sup>	NL <sup>#8</sup>	NL <sup>#8</sup>				NL <sup>#8</sup>														
Vapour Intrusion - Commercial Worker - 4-<8 m						6300 <sup>#7</sup>		NL <sup>#7</sup>				5100 <sup>#7</sup>	NL <sup>#7</sup>	NL <sup>#7</sup>				NL <sup>#7</sup>														
Vapour Intrusion - Commercial Worker - 8 m+						6500 <sup>#6</sup>		NL <sup>#6</sup>				5400 <sup>#6</sup>	NL <sup>#6</sup>	NL <sup>#6</sup>				NL <sup>#6</sup>														
Vapour Intrusion - Intrusive Maint Worker 2m -8m+						NL <sup>#9</sup>		NL <sup>#9</sup>				NL <sup>#9</sup>	NL <sup>#9</sup>	NL <sup>#9</sup>				NL <sup>#9</sup>														
Drinking Water												1 <sup>#11</sup>	800 <sup>#11</sup>	300 <sup>#11</sup>			600 <sup>#11</sup>		10 <sup>#11</sup>	4000 <sup>#11</sup>	2 <sup>#11</sup>		50 <sup>#11</sup>	2000 <sup>#11</sup>		10 <sup>#11</sup>		500 <sup>#2</sup>	1 <sup>#2</sup>	20 <sup>#11</sup>		
Ecological (Freshwater)																			13 <sup>#10</sup>	370 <sup>#10</sup>	0.2 <sup>#10</sup>		1 <sup>#10</sup>	1.4 <sup>#10</sup>		3.4 <sup>#10</sup>		1900 <sup>#10</sup>	0.06 <sup>#10</sup>	11 <sup>#10</sup>		
Recreational												10 <sup>#5</sup>	8000 <sup>#5</sup>	3000 <sup>#5</sup>			6000 <sup>#5</sup>		100 <sup>#5</sup>	40000 <sup>#5</sup>	20 <sup>#5</sup>		500 <sup>#5</sup>	20000 <sup>#5</sup>		100 <sup>#5</sup>		5000 <sup>#5</sup>	10 <sup>#5</sup>	200 <sup>#5</sup>		

Location Code	Field ID	SampleCode	Sampled Date	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<1	2	<50	<0.1	21,000	<1	2	-	<1	20,000	9870	<0.1	84	5000
MA_MW01	MA_MW01	ES1327570004	16-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<1	<1	<50	<0.1	25,000	<1	<1	-	<1	27,000	1800	<0.1	56	10,000
MA_MW07	MA_MW07	ES1327570001	16-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<1	4	<50	<0.1	32,000	<1	<1	-	<1	36,000	2480	<0.1	42	7000
MA_MW12	MA_MW12	ES1327570005	16-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<1	1	<50	<0.1	47,000	<1	2	8460	<1	50,000	1750	<0.1	108	8000
MA_X_5/D11	MA_X_5/D11	ES1324232005	06-Nov-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<1	2	<50	<0.1	42,000	<1	<1	59,800	<1	34,000	7590	<0.1	40	8000
MA_X_MW15	TE_MW15	ES1324232001	05-Nov-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<1	7	<50	0.1	11,000	<1	3	32,500	<1	14,000	6820	<0.1	20	6000
MA_X_MW16	TE_MW16	ES1324232002	05-Nov-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<1	2	<50	0.1	11,000	<1	3	63,100	<1	74,000	8680	<0.1	69	11,000
MG_X_4/D4	MG_X_4/D4	ES1324556003	08-Nov-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<1	129	<50	2	16,000	10	25	275,000	47	9000	1180	<0.1	52	8000
MG_X_4/D5	MG_X_4/D5	ES1323856007	01-Nov-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<1	2	130	0.5	107,000	<1	3	63,100	<1	74,000	8680	<0.1	69	11,000
ML_MW05	ML_MW05	ES1327988004	19-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<1	10	<50	<0.1	127,000	<1	<1	-	4	169,000	1780	<0.1	120	23,000
ML_MW07	ML_MW07	ES1328002003	18-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<1	3.1	17	0.52	22,000	<0.2	4.7	-	0.5	16,000	3820	<0.1	36	2000
ML_MW08	ML_MW08	ES1328003002	18-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<1	<1	<50	<0.1	8000	<1	2	-	2	9000	6490	<0.1	66	4000
ML_MW10	ML_MW10	ES1327988003	19-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<1	10	<50	0.5	116,000	<1	2	-	13	64,000	430	<0.1	106	17,000
ML_MW12	ML_MW12	ES1327570003	16-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<1	<1	<50	<0.1	18,000	<1	2	-	6	17,000	2920	<0.1	17	8000
ML_MW15	ML_MW15	ES1327988002	19-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<1	12	<50	0.4	60,000	<1	<1	-	<1	26,000	1240	<0.1	19	14,000
ML_MW20	ML_MW20	ES1327997002	19-Dec-13	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<1	<1	<50	<0.1	73,000	<1	<1	-	<1	51,000	2080	<0.1	117	11,000

Statistical Summary

Number of Results	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	5	15	15	15	15	15	15	15	15	15	15	15	15	
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	2	6	15	1	9	5	6	15	15	0	15	15	0	15	15	0	15	15		
Minimum Concentration	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<1	17	<0.1	8000	<0.2	<1	8460	0.5	9000	430	<0.1	17	2000	
Maximum Concentration	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<2	<1	129	130	2	127000	10	25	275000	47	169000	9870	<0.1	120	23000
Average Concentration	10	25	50	25	25	10	10	50	50	50	50	50	50	50	50	50	50	50	0.5	1	1	1	1	1	1	0.5	12	31	0.3	48333	1.1	3.2	87772	5.1	41067	3929	0.05	63	9467
Median Concentration	10	25	50	25	25	10	10	50	50	50	50	50	50	50	50	50	50	50	0.5	1	1	1	1	1	1	0.5	2	25	0.05	32000	0.5	2	59800	0.5	27000	2480	0.05	56	8000
Standard Deviation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	27	0.51	39851	2.5	6.1	106994	12	40617	3090	0	36	5330
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	5	0	1	9	0														













	Phenols														Field					Inorganics			
	Phenanthrene	Pyrene	PAHs (Sum of total)	Carcinogenic PAHs (as BaP TEQ)	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,4-dimethylphenol	2,6-dichlorophenol	2-chlorophenol	2-methylphenol	2-nitrophenol	3,6,4-methylphenol	4-chloro-3-methylphenol	Pentachlorophenol	Phenol	Dissolved Oxygen	EC	pH	ORP	TDS	Temp	Fluoride
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µS/cm	Units	mV	mg/L	°C	mg/L	
EQL	1	1	0.5	0.5	1	1	1	1	1	1	1	2	1	2	1								0.1
Drinking Water				0.01 <sup>#2</sup>		20 <sup>#2</sup>	200 <sup>#2</sup>			300 <sup>#2</sup>				0.05 <sup>#2</sup>									
Ecological (Freshwater)															320 <sup>#6</sup>								
Recreational				0.1 <sup>#5</sup>		200 <sup>#5</sup>	2000 <sup>#5</sup>			3000 <sup>#5</sup>				0.5 <sup>#5</sup>									

LocCode	Field_ID	Location	Sampled Date	Phenanthrene	Pyrene	PAHs (Sum of total)	Carcinogenic PAHs (as BaP TEQ)	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,4-dimethylphenol	2,6-dichlorophenol	2-chlorophenol	2-methylphenol	2-nitrophenol	3,6,4-methylphenol	4-chloro-3-methylphenol	Pentachlorophenol	Phenol	Dissolved Oxygen	EC	pH	ORP	TDS	Temp	Fluoride
MM_SS18	WL_SS18	Lake Lyell	21/11/2013	<1	<1	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<2	<1	7.01	443	8.1	141.8	287	15.3	0.4
MM_SS19	WL_SS19	Lake Lyell	21/11/2013	<1	<1	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<2	<1	7.12	438	8.17	128.9	284	15.9	0.4
MM_SS19	WL_SSC	Lake Lyell	21/11/2013	<1	<1	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<2	<1	-	-	-	-	-	-	-
MM_SS20	WL_SS20	Lake Lyell	21/11/2013	<1	<1	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<2	<1	7.1	432	8.3	130.5	281	15.9	0.4
MM_SS21	WL_SS21	Lake Lyell	21/11/2013	<1	<1	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<2	<1	4.78	553	8.25	120.8	352	15.7	0.5
MM_SS39	WL_SS39	Thompsons Creek Dam	22/11/2013	<1	<1	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<2	<1	9.96	475	8.28	156.3	308	15.8	0.4
MM_SS39	WL_SSE	Thompsons Creek Dam	22/11/2013	<1	<1	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<2	<1	-	-	-	-	-	-	-
MM_SS40	WL_SS40	Thompsons Creek Dam	21/11/2013	<1	<1	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<2	<1	10.03	472	7.96	175	310	15.4	0.4
MM_SS41	WL_SS41	Thompsons Creek Dam	22/11/2013	<1	<1	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<2	<1	10.06	477	8.33	158.2	310	15.4	-

Statistical Summary

Number of Results	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	7	7	7	7	7	7	7	6
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	7	7	7	7	7	7	6
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.78	432	7.96	120.8	281	15.3	0.4	
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10.06	553	8.33	175	352	15.9	0.5	
Average Concentration	0.5	0.5	0.25	0.25	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	1	0.5	8	470	8.2	145	305	16	0.42	
Median Concentration	0.5	0.5	0.25	0.25	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	1	0.5	7.12	472	8.25	141.8	308	15.7	0.4	
Standard Deviation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	41	0.13	19	25	0.26	0.041	
Number of Guideline Exceedances	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments

- #1 WHO (2011) DWQ
- #2 RIVM 2001 (Human-toxicological SRC GW) V Chlorinated Hydrocarbon
- #3 NHMRC 2011 ADWG Health (value for dichloromethane)
- #4 NHMRC 2011 ADWG Health (total 1,2-dichloroethene)
- #5 Guidelines for Managing Risk in Recreational Waters (2008) (GMRRW)
- #6 ASC NEPM (2013) GIL - Fresh Waters
- #7 ASC NEPM (2013) GIL - Drinking Water



	Asbestos Containing Material			
	g/kg	g/kg	%	-
EQL	0.1	0.1	0.001	-
Human Health - Asbestos		0.001 <sup>#1</sup>		

Location Code	Field ID	Sampled Date				
MA_MW01	MA_MW01_0.5	11-Nov-13	-	No	-	-
MA_MW03	MA_MW03_0.5	11-Nov-13	-	No	-	-
MA_MW05	MA_MW05_0.1	12-Nov-13	-	No	-	-
MA_MW07	MA-MW07-0.1	16-Oct-13	-	No	-	-
MA_MW08	MA_MW08_0.2	12-Nov-13	-	No	-	-
MA_MW12	MA-MW12-0.1	16-Oct-13	-	No	-	-
MB_MW02	MB_MW02_0.5	30-Oct-13	-	No	-	-
MB_MW03	MB_MW03_0.2	09-Oct-13	-	No	-	-
MB_MW04	MB_MW04_0.5	08-Oct-13	-	No	-	-
MB_MW05	MB_MW05_0.5	09-Oct-13	-	No	-	-
MB_MW08	MB_MW08_0.5	09-Oct-13	-	No	-	-
MC_MW01	MC_MW01_0.2	30-Oct-13	-	No	-	-
MC_MW02	MC_MW02_0.3	11-Oct-13	-	No	-	-
MC_MW03	MC_MW03_0.7	11-Oct-13	-	No	-	-
MC_MW04	MC_MW04_0.15	29-Oct-13	-	No	-	-
MD_MW01	MD_MW01_0.5	10-Oct-13	-	No	-	-
MD_MW02	MD_MW02_0.5	11-Nov-13	<0.1	No	<0.002	-
MD_MW03	MD_MW03_0.3	11-Nov-13	<0.1	No	<0.002	-
MD_MW04	MD_MW04_0.5	30-Oct-13	-	No	-	-
ME_MW04	ME_MW04_0.5	14-Nov-13	-	No	-	-
ME_SB01	ME-MW01-0.5	14-Nov-13	-	No	-	-
ME_SB02	ME_MW02_0.5	14-Nov-13	-	No	-	-
ME_SB03	ME-MW03-0.5	14-Nov-13	-	No	-	-
MF_MW01	MF_MW01_0.2	30-Oct-13	-	No	-	-
MF_MW02	MF_MW02_0.1	30-Oct-13	-	No	-	-
MF_MW03	MF_MW03_0.2	30-Oct-13	-	No	-	-
MF_MW04	MF_MW04_0.2	30-Oct-13	-	No	-	-
MF_MW05	MF_MW05_0.2	30-Oct-13	-	No	-	-
MG_SB02	MG_SB02_0.1	13-Nov-13	<0.1	No	<0.003	-
MG_SB03	MG_SB03_0.2	13-Nov-13	<0.1	No	<0.002	-
MH_MW01	MH_MW01_0.2	13-Nov-13	<0.1	No	<0.003	-
MH_MW02	MH_MW02_0.2	13-Nov-13	<0.1	No	<0.002	-
MH_MW03	MH_MW03_1.0	13-Nov-13	<0.1	No	<0.002	-
MH_SB04	MH_SB04_0.1	13-Nov-13	<0.1	No	<0.002	-
MI_SB02	MI_SB02_0.2	30-Oct-13	-	No	-	-
MI_SB03	MI_SB03_0.2	01-Nov-13	-	No	-	-
MI_SB05	MI_SB05_0.2	30-Oct-13	-	No	-	-
MI_SB06	MI_SB06_0.2	01-Nov-13	-	No	-	-
MI_SB07	MI_SB07_0.2	08-Oct-13	-	No	-	-
MK_SB01	MK_SB01_0.2	08-Nov-13	-	No	-	-
MK_SB02	MK_SB02_0.5	28-Oct-13	-	No	-	-
MK_SB03	MK_SB03_0.5	08-Nov-13	-	No	-	-
MK_SB04	MK_SB04_0.2	28-Oct-13	-	No	-	-
MK_SB05	MK_SB05_0.5	28-Oct-13	-	No	-	-
MK_SB06	MK_SB06_0.2	28-Oct-13	-	No	-	-
MK_SB08	MK_SB08_0.2	08-Nov-13	-	No	-	-
MK_SB09	MK_SB09_0.1	10-Oct-13	-	No	-	-
MK_SB10	MK_SB10_0.1	10-Oct-13	-	No	-	-
MK_SB11	MK_SB11_1.0	28-Oct-13	-	No	-	-
MK_SB12	MK_SB12_0.2	17-Oct-13	-	No	-	-
MK_SB13	MK_SB13_0.5	17-Oct-13	-	No	-	-
MK_SB14	MK_SB14_0.1	10-Oct-13	-	No	-	-
MK_SB15	MK_SB15_0.1	10-Oct-13	-	No	-	-
MK_SB16	MK_SB16_0.5	10-Oct-13	-	No	-	-
MK_SB16	MK_SB16_1.5	14-Oct-13	-	No	-	-
MK_SB17	MK_SB17_0.5	18-Oct-13	-	No	-	-
MK_SB18	MK_SB18_0.1	18-Oct-13	-	No	-	-
MK_SB19	MK_SB19_0.1	18-Oct-13	-	No	-	-
MK_SB20	MK_SB20_0.1	18-Oct-13	-	No	-	-
MK_SB22	MK_SB22_0.5	17-Oct-13	-	No	-	-
MK_SB24	MK_SB24_0.4	12-Nov-13	-	No	-	-
MK_SB25	MK_SB25_0.2	18-Oct-13	-	No	-	-
MK_SB26	MK_SB26_0.2	18-Oct-13	-	No	-	-
MK_SB27	MK_SB27_0.2	17-Oct-13	-	No	-	-
MK_SB28	MK_SB28_0.2	17-Oct-13	-	No	-	-
MK_SB30	MK_SB30_0.5	12-Nov-13	-	No	-	-
MK_SB31	MK-SB31-0.2	15-Oct-13	-	No	-	-
MK_SB32	MK-SB32-0.1	15-Oct-13	-	No	-	-
MK_SB33	MK_SB33_0.5	17-Oct-13	-	No	-	-
MK_SB34	MK_SB34_0.2	17-Oct-13	-	No	-	-
MK_SB35	MK_SB35_1.0	17-Oct-13	-	No	-	-
MK_SB36	MK-SB36-0.1	15-Oct-13	-	No	-	-
MK_SB37	MK-SB37-0.3	15-Oct-13	-	No	-	-
MK_SB39	MK-SB39-1.0	15-Oct-13	-	No	-	-
MK_SB40	MK-SB40-0.7	15-Oct-13	-	No	-	-
MK_SB42	MK_SB42_0.4	11-Nov-13	-	No	-	-
MK_SB43	MK_SB43_0.2	06-Nov-13	-	No	-	-
MK_SB44	MK_SB44_0.2	06-Nov-13	-	No	-	-
MK_SB45	MK_SB45_0.05	27-Nov-13	-	No	-	-
MK_SB46	MK_SB46_1.0	29-Oct-13	-	No	-	-
MK_SB47	MK_SB47_0.5	29-Oct-13	-	No	-	-
MK_SB49	MK_SB49_0.5	07-Nov-13	-	No	-	-
MK_SB50	MK-SB50-0.1	14-Oct-13	-	No	-	-
MK_SB51	MK_SB51_1.0	30-Oct-13	-	No	-	-

	Asbestos Containing Material	Asbestos fibres detected	Asbestos Fines and Fibrous Asbestos (<7mm)	Asbestos Type
	ppm	g/kg	%	-
EQL	0.1	0.1	0.001	-
Human Health - Asbestos		0.001 <sup>#1</sup>		

Location Code	Field ID	Sampled Date	Asbestos Containing Material (ppm)	Asbestos fibres detected (g/kg)	Asbestos Fines and Fibrous Asbestos (<7mm) (%)	Asbestos Type
MK_SB52	MK-SB52-0.1	14-Oct-13	-	No	-	-
MK_SB54	MK_SB54_0.15	11-Nov-13	<0.1	No	<0.002	-
MK_SB55	MK-SB55-0.2	15-Oct-13	-	No	-	-
MK_SB56	MK-SB56-0.2	15-Oct-13	-	No	-	-
MK_SB57	MK-SB57-1.0	15-Oct-13	-	No	-	-
MK_SB58	MK_SB58_0.1	29-Oct-13	-	No	-	-
MK_SB59	MK-SB59-0.2	15-Oct-13	-	No	-	-
MK_SB61	MK_SB61_0.4	14-Nov-13	-	No	-	-
MK_SB62	MK_SB62_0.2	06-Nov-13	-	No	-	-
MK_SB63	MK_SB63_0.03	27-Nov-13	-	No	-	-
MK_SB64	MK_SB64_0.05	27-Nov-13	-	No	-	-
MK_SB65	MK_SB65_0.5	07-Nov-13	-	No	-	-
MK_SB66	MK_SB66_0.05	27-Nov-13	-	No	-	-
MK_SB67	MK_SB67_0.05	27-Nov-13	-	No	-	-
MK_SB68	MK-SB68-0.1	15-Oct-13	-	No	-	-
MK_SB69	MK_SB69_0.05	27-Nov-13	-	No	-	-
MK_SB71	MK_SB71_0.5	12-Nov-13	-	No	-	-
MK_SB72	MK_SB72_0.5	07-Nov-13	-	No	-	-
MK_SB75	MK_SB75_0.05	27-Nov-13	-	No	-	-
MK_SB76	MK_SB76_0.2	29-Oct-13	-	No	-	-
MK_SB78	MK_SB78_0.5	07-Nov-13	-	No	-	-
MK_SB79	MK_SB79_0.5	07-Nov-13	-	No	-	-
MK_SB81	MK_SB81_1.0	29-Oct-13	-	No	-	-
MK_SB82	MK_SB82_0.2	29-Oct-13	-	No	-	-
MK_SB84	MK_SB84_0.2	06-Nov-13	-	No	-	-
MK_SB86	MK_SB86_0.5	29-Oct-13	-	No	-	-
MK_SB87	MK_SB87_0.5	28-Oct-13	-	No	-	-
ML_MW02	ML_MW02_0.2	01-Nov-13	-	No	-	-
ML_MW03	ML-MW03-0.2	16-Oct-13	-	No	-	-
ML_MW05	ML_MW05_2.9	31-Oct-13	-	No	-	-
ML_MW05	ML-MW05-0.5	16-Oct-13	-	No	-	-
ML_MW07	ML-MW07-0.2	08-Nov-13	-	No	-	-
ML_MW08	ML_MW08_0.5	09-Oct-13	-	No	-	-
ML_MW10	ML-MW10-0.2	16-Oct-13	-	No	-	-
ML_MW12	ML_MW12_0.1	16-Oct-13	-	No	-	-
ML_MW14	ML_MW14_0.1	28-Nov-13	-	No	-	-
ML_MW15	ML-MW15-0.1	16-Oct-13	-	No	-	-
ML_MW17	ML_MW17_0.2	14-Oct-13	-	No	-	-
ML_MW18	ML-MW18-0.1	16-Oct-13	-	No	-	-
ML_MW19	ML_MW19_0.1	14-Oct-13	-	No	-	-
ML_MW20	ML_MW20_0.1	14-Oct-13	-	No	-	-
ML_MW21	ML_MW21_0.1	14-Oct-13	-	No	-	-
ML_MW22	ML_SB22_0.05	27-Nov-13	-	No	-	-
ML_MW23	ML_MW23_0.1	14-Oct-13	-	No	-	-
ML_MW24	ML_MW24_0.2	16-Oct-13	-	No	-	-
ML_SB25	ML_SB25_0.05	06-Nov-13	<0.1	No	<0.003	-
ML_SB26	ML_SB26_0.05	06-Nov-13	<0.1	No	<0.003	-
ML_SB27	ML_SB27_0.05	06-Nov-13	<0.1	No	<0.003	-
ML_SB28	ML_SB28_0.05	06-Nov-13	<0.1	No	<0.002	-
ML_SB29	ML_SB29_0.1	27-Nov-13	-	No	-	-
ML_SB30	ML_SB30_0.1	26-Nov-13	-	No	-	-
ML_SB31	ML_SB31_0.1	27-Nov-13	-	No	-	-
ML_SB32	ML_SB32_0.05	26-Nov-13	-	No	-	-
ML_SB34	ML_SB34_0.05	27-Nov-13	-	No	-	-
ML_SB35	ML_SB35_0.1	06-Nov-13	<0.1	No	<0.001	-
ML_SB36	ML_SB36_0.05	06-Nov-13	<0.1	No	<0.002	-
ML_SB37	ML_SB37_0.05	06-Nov-13	-	No	-	-
ML_SB38	ML_SB38_0.05	06-Nov-13	<0.1	No	<0.002	-
ML_SB39	ML_SB39_0.1	26-Nov-13	-	No	-	-
ML_SB40	ML_SB40_0.1	26-Nov-13	-	No	-	-

**Statistical Summary**

Number of Results	16	144	16	144
Number of Detects	0	0	0	0

**Comments**

#1 ASC NEPM (2013) Health Screening Level for Asbestos in Soil - FA and AF (Friable Asbestos)



Table 7. CEC - PSD, Soil Class and Inorganics Summary  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

	Cations				PSD												Soil Classification					Inorganics							
	Calcium/Magnesium Ratio	Exchangeable Sodium Percent	CEC	Magnesium/Potassium Ratio	% >75um	+75um	+150um	+300um	+425um	+600um	+1180um	+2.36mm	+4.75mm	+9.5mm	+19mm	+37.5mm	+75.0mm	Clay	Cobbles	Gravel	Silt	Sand	Exchangeable Aluminium	Exchangeable Calcium	Exchangeable Magnesium	Exchangeable Potassium	Exchangeable Sodium	Electrical conductivity *(lab)	TOC
	-	%	meq/100g	-	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	meq/100g	meq/100g	meq/100g	meq/100g	meq/100g	µS/cm	%
EQL	0.1	0.1	0.1	0.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.1	0.1	0.1	0.1	0.1	1	0.5

Location Code	Field ID	Sampled Date	1	1.7	4.6	12.1	-	64	57	44	36	29	21	16	10	4	<1	<1	<1	-	<1	16	-	49	<0.1	2.2	2.2	0.2	<0.1	-	0.7
MA_MW12	MA_MW12_4.9-5.0	26-Nov-13	1	1.7	4.6	12.1	-	64	57	44	36	29	21	16	10	4	<1	<1	<1	-	<1	16	-	49	<0.1	2.2	2.2	0.2	<0.1	-	0.7
MH_MW01	MH_MW01_0.2	13-Nov-13	-	-	7.2	-	41	59	57	56	55	54	51	46	37	29	3	<1	<1	-	<1	46	13	-	-	4.6	1.9	0.6	<0.1	-	2.7
MH_MW02	MH_MW02_0.2	20-Nov-13	-	-	4.2	-	-	64	55	48	46	44	42	39	36	30	30	23	<1	13	<1	39	23	25	-	3.1	0.9	0.2	<0.1	55	-
MH_MW03	MH_MW03_0.2	13-Nov-13	-	-	11.4	-	40	60	60	59	59	58	58	56	52	44	40	34	<1	-	<1	56	5	-	-	5.7	5.1	0.5	0.1	-	0.6
ML_MW03	ML_MW03_1.7-2.0	29-Oct-13	-	-	5.5	-	-	20	16	15	15	14	14	12	9	5	<1	<1	<1	31	<1	11	49	9	-	1.2	4	0.2	<0.1	-	1.4
ML_MW05	ML_MW05_2.9	31-Oct-13	-	-	3.5	-	-	30	25	22	22	21	18	16	12	9	<1	<1	<1	25	<1	16	44	15	-	0.6	2.3	0.4	0.1	-	<0.5
ML_MW07	ML-MW07-0.2	08-Nov-13	-	1.2	4.4	-	-	65	59	53	48	43	34	28	23	18	14	8	<1	18	<1	28	16	38	-	2.2	2	0.2	<0.1	-	1.8
ML_MW14	ML_MW14_0.1-0.2	28-Nov-13	-	-	6.2	-	-	86	82	78	76	73	66	57	45	33	17	4	<1	-	<1	57	-	29	<0.1	5.1	1	<0.1	<0.1	-	1

Statistical Summary

Number of Results	1	2	8	1	2	8	8	8	8	8	8	8	8	8	8	8	8	8	8	4	8	8	6	6	2	8	8	8	8	1	7
Number of Detects	1	2	8	1	2	8	8	8	8	8	8	8	8	8	8	5	4	0	4	0	8	6	6	0	8	8	7	2	1	6	
Minimum Concentration	1	1.2	3.5	12.1	40	20	16	15	15	14	14	12	9	4	<1	<1	<1	13	<1	11	5	9	<0.1	0.6	0.9	<0.1	<0.1	55	<0.5		
Maximum Concentration	1	1.7	11.4	12.1	41	86	82	78	76	73	66	57	52	44	40	34	<1	31	<1	57	49	49	<0.1	5.7	5.1	0.6	0.1	55	2.7		
Average Concentration			5.9			56	51	47	45	42	38	34	28	22	13	8.9	0.5	22	0.5	34	25	28			3.1	2.4	0.29	0.063		1.2	
Median Concentration	1	1.45	5.05	12.1	40.5	62	57	50.5	47	43.5	38	33.5	29.5	23.5	8.5	2.25	0.5	21.5	0.5	33.5	19.5	27	0.05	2.65	2.1	0.2	0.05	55	1		
Standard Deviation			2.5			21	21	20	20	20	19	18	17	15	15	13	0	7.9	0	18	18	15			1.9	1.4	0.19	0.023		0.84	
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	



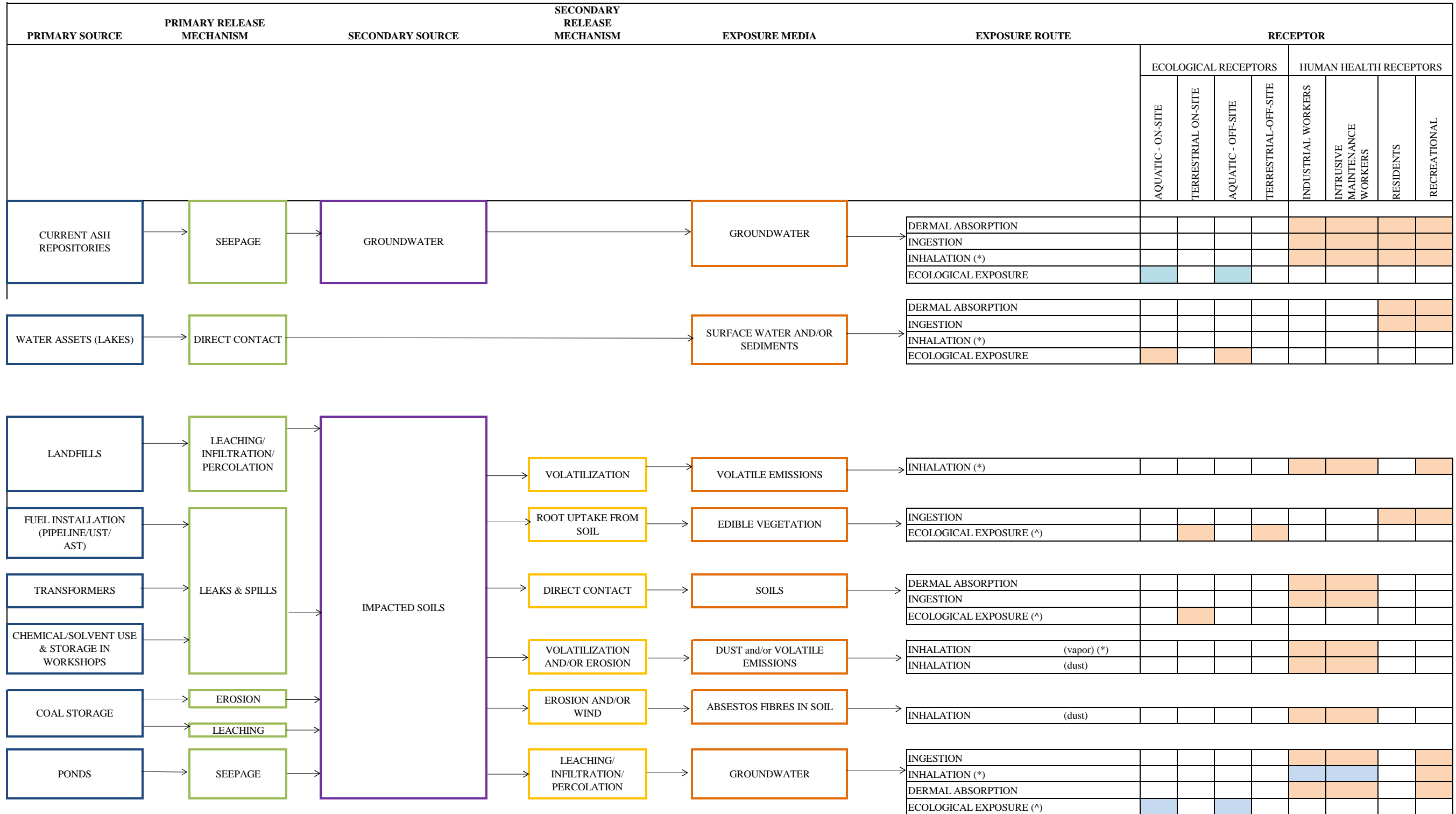
Stage	Area	Sampling Element	SB	MW	SS	SW	Total Locations	Existing MWs	SBs from other AECs	Wells From Adjacent AECs	Total GW Locations (Existing + New)	Total Soil Locations (SB + MW)	Total Water Locations (Existing MW + MW + SW)	Total Soil/Sed Locations (SB + MW + SS)	Operational Constraints
Proposed	MA	Former Landfills	0	12	0	0	12	0	-	--	12	12	12		The landfills are located in non-operational areas with access limited to tracks and roadways due to dense bush and scrub surrounding the locations. Overhead high voltage electricity cables also pose a high risk and locations may be moved and/or abandoned if sufficient clearance from the overhead cables cannot be achieved.
Actual	MA	Former Landfills	3	3	0	0	9	3	3	3	9	9	9		Change in CSM (see discussion in text). Above operational constraints also reduced suitable drilling locations. Additional soil and groundwater data incorporated from existing monitoring wells and from adjacent AECs.
Proposed	MB	Coal Storage Area	0	5	0	0	5	0	-	--	5	5	5		The coal storage area is an active operational area with multiple hazards. Therefore boreholes are proposed around the perimeter of the area with the locations dependent on infrastructure and access for vehicles.
Actual	MB	Coal Storage Area	1	4	0	0	5	1	6	1	7	11	7		A monitoring well could not be installed at MB_MW01 due to refusal at shallow depth, and this location was a soil bore only. Additional monitoring wells from adjacent AECs provide additional lines of evidence to assess AEC MB.
Proposed	MC	Electrical Transformers	0	4	0	0	4	0	-	--	4	4	4		Sampling locations in this area are restricted to the perimeter of the designated excluded area as well as being outside of the buffer for the high voltage overhead cables.
Actual	MC	Electrical Transformers	0	4	0	0	4	0	-	2	6	4	6		All locations proposed were completed.
Proposed	MD	Workshops	0	5	0	0	5	0	-	--	5	5	5		Sampling locations are proposed outside of workshop buildings and on unpaved areas where feasible.
Actual	MD	Workshops	6	3	0	0	4		2	2	5	8	5		Monitoring wells could not be installed at 2 locations due to proximity to underground utilities. Additional monitoring wells from adjacent AECs provide additional lines of evidence.
Proposed	ME	Mobile Plant Refuelling Area	0	4	0	0	4	0	-	--	4	4	4		Sampling locations are proposed adjacent to the concreted area and shed in the mobile plant refuelling area.
Actual	ME	Mobile Plant Refuelling Area	4	1	0	0	4	7	-	--	8	4	8		Monitoring wells were not completed at three locations due to concurrent investigation by others in this area at the time of drilling. Soil bores were completed at these three locations. Groundwater samples were collected from monitoring wells installed by others in this area, and from adjacent AECs.
Proposed	MF	Operational ASTs	0	5	0	0	5	0	-	--	5	5	5		Sampling locations are proposed outside of the bunded area and on unpaved areas where feasible.
Actual	MF	Operational ASTs	0	5	0	0	5	0	-	--	5	5	5		All locations proposed were completed.
Proposed	MG	Current Ash Repository	3	0	0	0	3	8	-	--	8	3	8		Soil sampling locations are proposed around the perimeter of the ash repository near the location of existing wells. The feasibility of access to these areas may limit the number and location of soil bores.
Actual	MG	Current Ash Repository	2	0	0	0	2	8	-	--	8	2	8		One soil bore was located outside the Site boundary and a suitable location within the Site could not be located.
Proposed	MH	Lamberts North Ash Repository	6	1	3	3	10	8	-	--	9	7	9		Soil sampling locations are proposed around the perimeter of the ash repository near the location of existing wells. The feasibility of access to these areas may limit the number and location of soil bores.
Actual	MH	Lamberts North Ash Repository	5	3	2	2	6	5	1	3	11	6	12		Change in CSM (see discussion in text). Operational constraints also reduced suitable drilling locations, and not all of the existing monitoring wells could be located. Two additional monitoring wells were installed in the former mine area.
Proposed	MI	Water Holding Ponds	8	0	0	0	8	6	-	--	6	8	6		Soil sampling locations are proposed around the water holding ponds near the location of existing wells.
Actual	MI	Water Holding Ponds	7	0	0	0	6	6	-	--	6	6	6		Hand clearance at one location was terminated at a shallow depth due to presence of coarse fill material and rubble, and insufficient fines were available for sampling.
Proposed	MJ	Operational USTs	0	0	0	0	0	6	-	--	6	0	6		Soil conditions will be assessed utilising grid base sampling locations in accessible operational areas.
Actual	MJ	Operational USTs	0	0	0	0	0	6	2	2	8	2	8		All locations proposed were completed.
Proposed	MK	Accessible Operational Areas	81	9	0	0	90	0	-	--	9	81	9		A 50 x 50 m grid will be established, with bores eliminated in areas where underground or overhead utilities are present and in hazardous areas. Defined exclusion areas will include the main operations buildings, the transformer yard and areas beneath high voltage overhead cables. Where possible bores will be located on bare ground, although some bores may be required on hardstanding.
Actual	MK	Accessible Operational Areas	73	11	0	0	84	6	10	7	24	83	24		6 soil bore locations were abandoned due to the presence of underground utilities and other operational hazards including traffic. An additional 2 monitoring wells were installed around the perimeter of the operational area. It is considered that the number and distribution of completed boreholes and monitoring wells is sufficient for characterising soil and groundwater conditions for the purpose of this baseline assessment.
Proposed	ML	Non Operational Areas	16	24	0	0	40	0	-	--	24	40	24		Locations will be targeted to accessible areas along existing tracks and roads in densely vegetated areas and will consider the location of high voltage overhead cables.
Actual	ML	Non Operational Areas	24	8	0	0	32	-	-	8	16	32	16		Change in CSM (see discussion in text). It is considered that the number and distribution of completed boreholes and monitoring wells is sufficient for characterising soil and groundwater conditions for the purpose of this baseline assessment.
Proposed	MM	Water Assets	0	0	12	12	12	0	-	--	0	0	12		It is noted that access will need to be established to the lakes and sampling will be undertaken by boat.
Actual	MM	Water Assets	0	0	14	14	14	0	-	--	0	0	14		All locations proposed were completed.
Proposed	Proposed Total		114	69	15	15	198	28			97	183	112	198	
Actual	Actual Total		145	42	16	16	203	35			77	187	93	203	
	Difference		31	-27	1	1	5	7			-20	4	-19	5	

**Notes:**  
 SB = Soil Bore (not including bores converted to MW)  
 MW = Soil Bore converted to Groundwater Monitoring Well  
 SS = Sediment Sample  
 Total Locations = SB + MW (or SS)  
 Existing MWs = based on available reports and assumes wells are operational for sampling.  
 Total MWs = proposed wells + existing wells

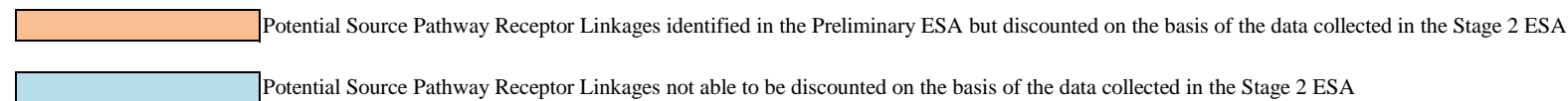
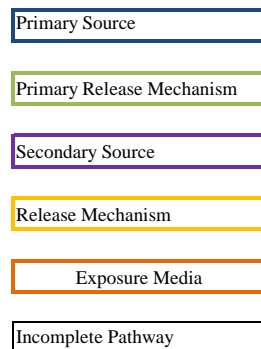


Annex C

Refined CSM



**LEGEND**



Notes:

(\*) Exposure limited to volatile compounds as defined in the text; residential and worker receptors include both indoor and outdoor air exposure to volatiles; nonresidential and nonworker receptors include only outdoor air exposure. For residents, inhalation of volatiles from shallow groundwater includes pathways associated with both domestic use and migration to indoor air, whereas, nonresidential exposure includes only migration to indoor and outdoor air for workers and only outdoor air for recreators. Exposure to fugitive dust is limited to non-volatile organic compounds.

(^\*) Exposure pathway incomplete where hardstanding is present in operational areas and roadways. It is also noted that vegetation in operational areas is typically limited to grasses with shallow root zones.

Annex D

## Borelogs

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MA\_MW01**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>11/11/2013</b>	Total Depth (m): <b>4.9</b>	Final Water Level (m bgl): <b>3.736</b>
Drill Finish Date: <b>22/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>973.264</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>973.946</b>
Driller: <b>Jared Mudie</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>222454.755</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304458.476</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>4.0</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Gravelly clay with some sand, brown, dry, coarse angular gravels (40%) including sandstone and coal, some cobbles <200mm, no staining.			0		DS	Y		0.1	MA_MW01_0.5	
<b>Fill</b> Clayey sand with gravel, grey-brown, gravels (30%), <20mm angular, poorly sorted, moist with no evidence of contamination.			2					0		
<b>Fill</b> Gravel, dark brown-grey, wet, gravels are coarse and angular, some clay within matrix.			3		US	Y		0.1	MA_MW01_2.6	
<b>Clay</b> Dark brown, wet, soft, high plasticity, organic matter (roots, twigs, fibrous material), organic like odour. Becoming pale grey with mottling, and moist at 2.7m with rare black gravels, becoming stiff at 3.1m and hard at 3.6m, becoming wet from 3.6m.			4							
End of Log			5							End of hole at 4.9 m bgl, target depth achieved.
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MA\_MW03**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>11/11/2013</b>	Total Depth (m): <b>3.0</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>22/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): -
Drill Co: <b>Numac</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Jared Mudie</b>	Casing Diam. (mm): -	Easting (MGA): <b>222589</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6304559</b>
Hole Type: <b>Soil Bore</b>	Water Strike (m bgl): -	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Gravelly clay with some sand and cobbles, brown, fine to coarse angular gravels, poorly sorted, medium plasticity, no staining, roots and rootlets.			0					0		
<b>Fill</b> Gravelly sand, pale brown becoming dark brown at 1.5m, medium to coarse grained sands, angular, coarse sandstone gravels <30mm (30%), no staining, cobbles from 1.2 m. m.			1		DS	Y		0.1	MA_MW03_0.5	
<b>Sandstone</b> Orange, medium to coarse grained, angular, homogenous, very stiff/hard, some angular quartz gravels 20mm, becoming pale grey and soft friable at 2.5m, unconsolidated, no evidence of contamination.			2					0.1		
<b>Shale</b> Dark grey/black, very fine grained, hard, homogenous.			3							End of hole at 3.0 m bgl, target depth achieved.
End of Log			4							
			5							
			6							

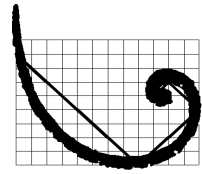
**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MA\_MW05**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **12/11/2013**      Total Depth (m): **0.3**      Final Water Level (m bgl): -  
 Drill Finish Date: **12/11/2013**      Hole Diam. / Width (mm): **300**      Elevation (Ground): -  
 Drill Co: **Cardno**      Casing Type: **None**      Elevation (Case): -  
 Driller: **Simon King**      Casing Diam. (mm): -      Easting (MGA): **222647**  
 Drill Method: **NDD**      Surface Completion: **Backfill**      Northing (MGA): **6304666**  
 Hole Type: **Soil Bore**      Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Gravelly clay, brown, coarse angular gravels <100mm (50%), poorly sorted, no staining.					DS	Y			MA_MW05_0.1	End of hole at 0.1 m bgl, NDD refusal on sandstone.
End of Log			1							
			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MA\_MW07**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>16/10/2013</b>	Total Depth (m): <b>8.2</b>	Final Water Level (m bgl): <b>7.692</b>
Drill Finish Date: <b>25/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>956.108</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>956.608</b>
Driller: <b>Jared Mudie</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>222912.408</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304608.314</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>7.0</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Gravelly clay with some cobbles, brown, dry, medium plasticity, angular gravels (40%), gravels include siltstone, shale, sandstone and coal, no staining, no odour, rootlets.			0		DS	Y			MA-MW07-0.1	
<b>Fill</b> Gravelly clay, black, slightly moist, very stiff, gravels are coal and shale only, coarse, angular, (60%), rare friable sandstone cobbles, no staining or odour.			2.5					0		
<b>Siltstone</b> Dark grey, dry, very fine grained, homogenous, no evidence of contamination.			3.0		US	Y		0	MA_MW07_3.0	
<b>Sandstone</b> Pale grey, medium to coarse grained, friable, homogenous, no evidence of contamination.			3.5							
<b>Gravelly Clay</b> Dark brown-black, moist, medium-coarse grained coal, shale and orange and grey sandstone, stiff, poorly sorted gravels, angular <20mm (50%), no evidence of contamination.			4.0							
<b>Sandstone</b> Grey, fine-medium-coarse grained sub angular gravels, slightly moist, sub-rounded-angular, poorly sorted, no evidence of contamination.			5.5							
<b>Shale</b> Dark grey-black, hard, dry, very fine grained, homogenous.			6.5							
<b>Sandstone</b> Brown, slightly moist, becoming wet at 7m, medium grained with some fine gravels, becoming coarse grained (5.5m) and fine - medium grained (6.5 - 7.5m), poorly sorted, hard from 8m, minor shale layer between 5.5 - 6.5m. No evidence of contamination.			7.5							
			8.2							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MA\_MW07**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>16/10/2013</b>	Total Depth (m): <b>8.2</b>	Final Water Level (m bgl): <b>7.692</b>
Drill Finish Date: <b>25/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>956.108</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>956.608</b>
Driller: <b>Jared Mudie</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>222912.408</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304608.314</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>7.0</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			7 8		DS	Y			MA_MW07_8.1	End of hole at 8.2 m bgl, target depth achieved.
End of Log			9 10 11 12							

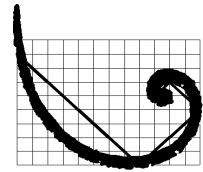
**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MA\_MW08**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **12/11/2013** Total Depth (m): **0.8** Final Water Level (m bgl): -  
 Drill Finish Date: **12/11/2013** Hole Diam. / Width (mm): **300** Elevation (Ground): -  
 Drill Co: **Cardno** Casing Type: **None** Elevation (Case): -  
 Driller: **Simon King** Casing Diam. (mm): - Easting (MGA): **222768**  
 Drill Method: **NDD** Surface Completion: **Backfill** Northing (MGA): **6304454**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

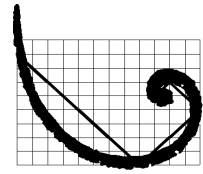
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Silty Clay</b> With some gravel, orange brown with minor red and brown mottles, coarse angular gravels, <50mm (10%), moderately plastic, homogenous, no staining, organic matter (roots, rootlets).  <b>Clay</b> Clay, orange with minor red mottles, moderately plastic, no staining. Refusal on pale brown-orange siltstone at 0.8m.			0		DS	Y			MA_MW08_0.2	End of hole at 0.8 m bgl, NDD refusal on siltstone.
					DS	Y			MA_MW08_0.5	
End of Log			1							
			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MA\_MW12**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>16/10/2013</b>	Total Depth (m): <b>5.0</b>	Final Water Level (m bgl): <b>4.457</b>
Drill Finish Date: <b>26/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>946.818</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>947.505</b>
Driller: <b>Jared Mudie</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223180.343</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304785.839</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>4.0</b>	

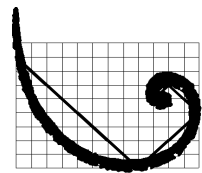
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Gravelly clay with some cobbles, brown, dry, low plasticity, angular gravels, 15-75mm, no odour, no staining, roots and rootlets, gravels.			0		DS	Y			MA-MW12-0.1	
<b>Fill</b> Gravelly clay, dark brown, dry, stiff, fine angular gravels <5mm (40%), poorly sorted, homogenous, no evidence of contamination.			1					0.8 1.8		
<b>Fill</b> Gravelly clay, brown, dry becoming moist at 2.7m and wet at 4m, stiff, becoming medium stiff (3.6m) and soft (4m), gravels <50mm, poorly sorted, some sand from 2.7m increasing with depth, some organic matter (rootlets), no evidence of contamination.			2							
			3		US	Y		0.1	MA_MW12_2.8	
<b>Sandy Clay</b> Brown, wet, soft, low plasticity, (high between 4.1 - 4.15m), becoming hard at 4.2m.			4							
			5		DS	Y		0	MA_MW12_4.9-5.0	End of hole at 5.0 m bgl, target depth achieved.
End of Log			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MB\_MW01**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>9/10/2013</b>	Total Depth (m): <b>1.1</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>9/10/2013</b>	Hole Diam. / Width (mm): <b>200</b>	Elevation (Ground): -
Drill Co: <b>Numac</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Scott Jessup</b>	Casing Diam. (mm): -	Easting (MGA): <b>224090</b>
Drill Method: <b>NDD</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6305823</b>
Hole Type: <b>Soil Bore</b>	Water Strike (m bgl): -	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Clayey gravel with cobbles, brown, angular gravels and cobbles, no odour.					DS	Y		0	MB_MW01_0.2	
			1							
End of Log			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MB\_MW02**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>9/10/2013</b>	Total Depth (m): <b>14.8</b>	Final Water Level (m bgl): <b>12.720</b>
Drill Finish Date: <b>26/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>930.64</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>931.33</b>
Driller: <b>Jared Mudie</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224276.761</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6305734.520</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>12.4</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Clay with some angular gravel, brown, dry, no staining, no odour, rootlets. Shale cobble between 0.3-0.35m.			0		DS	Y		0	MB_MW02_0.2	
			0.35		DS	Y		0	MB_MW02_0.5	
<b>Fill</b> Clayey sand with gravel (20%), pale yellow-grey, non-plastic, poorly sorted, fine to coarse grained sands, fine to medium gravels, up to 40mm, sands are sub-rounded, angular gravels, no odour, no staining, siltstone cobbles present 0.8-1.1m.			1					0		
			2					2.1		
<b>Fill</b> Gravelly clay, dark grey-brown, slightly moist, coal and sandstone gravels (50%) <50mm, stiff, no evidence of contamination, homogenous.			3		US	Y			MB_MW02_3.0	
			4							
<b>Clay</b> With gravels, dark brown, moist, high plasticity, fine angular and rounded gravels <5mm (10%), homogenous, no evidence of contamination, becoming hard at 6.4m, some gravel <30mm sub-rounded to angular at 8.9m.			5					0		
			6							

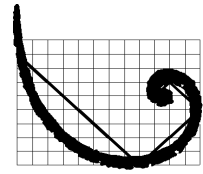
**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MB\_MW02**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **9/10/2013**  
 Drill Finish Date: **26/11/2013**  
 Drill Co: **Numac**  
 Driller: **Jared Mudie**  
 Drill Method: **NDD/PT/SFA**  
 Hole Type: **Monitoring Well**

Total Depth (m): **14.8**  
 Hole Diam. / Width (mm): **125**  
 Casing Type: **uPVC**  
 Casing Diam. (mm): **50**  
 Surface Completion: **Monument**  
 Water Strike (m bgl): **12.4**

Final Water Level (m bgl): **12.720**  
 Elevation (Ground): **930.64**  
 Elevation (Case): **931.33**  
 Easting (MGA): **224276.761**  
 Northing (MGA): **6305734.520**

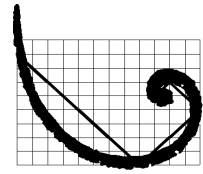
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			7					1.1		
			8							
			9					0.9		
<b>Sandy Clay</b> With some gravel, dark brown, moist, medium plasticity, fine sands, gravels fine-medium <5-40mm, sub-angular to rounded gravel pebbles include fine black quartz, sandstone and black and orange pebbles, becoming hard at 12m.			10							
			11							
			12							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MB\_MW02**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **9/10/2013** Total Depth (m): **14.8** Final Water Level (m bgl): **12.720**  
 Drill Finish Date: **26/11/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): **930.64**  
 Drill Co: **Numac** Casing Type: **uPVC** Elevation (Case): **931.33**  
 Driller: **Jared Mudie** Casing Diam. (mm): **50** Easting (MGA): **224276.761**  
 Drill Method: **NDD/PT/SFA** Surface Completion: **Monument** Northing (MGA): **6305734.520**  
 Hole Type: **Monitoring Well** Water Strike (m bgl): **12.4**

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
<b>Sandy Clay</b> Brown, wet, soft, rare fine gravels <5mm, homogenous, no evidence of contamination, soft between 12.4-13.5m.			13							
			14	DS	Y				MB_MW02_14.7	End of hole at 14.8 m bgl, target depth achieved.
End of Log			15							
			16							
			17							
			18							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MB\_MW03**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>9/10/2013</b>	Total Depth (m): <b>8.0</b>	Final Water Level (m bgl): <b>4.020</b>
Drill Finish Date: <b>18/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>932.998</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>932.942</b>
Driller: <b>Jared Mudie</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224228.704</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Gatic</b>	Northing (MGA): <b>6305502.010</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>6.0</b>	

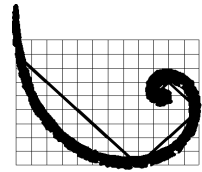
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Clayey gravel with some cobbles, brown, non-plastic, angular gravels, no staining, no odour.			0		DS	Y		0	MB_MW03_0.2	
<b>Fill</b> Sandy clay with some gravel, light brown, medium plasticity, angular gravels, homogenous, no staining, no odour.			1		DS	Y		0.1	T01_091013_TS	
<b>Fill</b> Sand with coal gravels, pale grey, coarse angular sands, poorly sorted, no staining or evidence of contamination.			2							
<b>Fill</b> Clay with some gravels, orange-brown with some red mottling, slightly moist, medium plasticity, no evidence of contamination.			3		US	Y		0	MB_MW03_3.0	
<b>Fill</b> Sand, pale grey, moist, coarse, angular, no evidence of contamination.			4							
<b>Fill</b> Clay with coal gravels and shale cobbles, orange-brown with red mottling, angular gravels <50mm (20%), no evidence of contamination.			4.5							
<b>Clay</b> With some gravels, orange-brown with red mottling, moist with grey mottling at 4.5m, angular and rounded gravels <50mm (10%), no evidence of contamination			5					0.2		

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MB\_MW03**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>9/10/2013</b>	Total Depth (m): <b>8.0</b>	Final Water Level (m bgl): <b>4.020</b>
Drill Finish Date: <b>18/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>932.998</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>932.942</b>
Driller: <b>Jared Mudie</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224228.704</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Gatic</b>	Northing (MGA): <b>6305502.010</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>6.0</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
<b>Siltstone</b> Brown-grey, becoming grey with depth, weathered, slightly moist, becoming wet at 6m. Fine grained, angular, grey with some dark grey mottles at 6m, homogenous.			6							
End of Log			8					0.2		End of hole at 8.0 m bgl, target depth achieved.
			9							
			10							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MB\_MW04**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>8/10/2013</b>	Total Depth (m): <b>8.2</b>	Final Water Level (m bgl): <b>2.415</b>
Drill Finish Date: <b>18/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>936.021</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>936.068</b>
Driller: <b>Jared Mudie</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223958.077</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Gatic</b>	Northing (MGA): <b>6305366.642</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>6.5</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Clay with gravels, orange-brown, dry, angular gravels, poorly sorted, no staining, no odour.			0							
<b>Fill</b> Sandy silt with gravels and some angular cobbles, dark grey-brown, angular gravels, poorly sorted, no staining, no odour.			0		DS	Y			MB_MW04_0.5	
<b>Fill</b> Clay with some gravels, dark brown with orange, dark red and grey mottling from 2.7m, angular gravels 5-30mm (40%), poorly sorted, stiff, low plasticity, increasing gravel content and cobbles from 2.7m, no evidence of contamination.			1							
			2					0		
			3					0		
<b>Clay</b> With some gravels, dark grey, mottled pale red and grey at 7m, slightly moist, stiff, homogenous, sub-rounded to angular gravels, fine 5mm (10%). Becoming wet, soft and plastic at 6.5m, rare rootlets, no evidence of contamination.			4							
			5		US	Y		0.2	MB_MW04_3.5	
			6					0		

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Log By: **T. Shaw**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

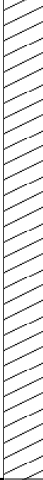
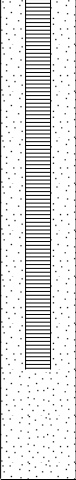
**ID: MB\_MW04**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>8/10/2013</b>	Total Depth (m): <b>8.2</b>	Final Water Level (m bgl): <b>2.415</b>
Drill Finish Date: <b>18/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>936.021</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>936.068</b>
Driller: <b>Jared Mudie</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223958.077</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Gatic</b>	Northing (MGA): <b>6305366.642</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>6.5</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			7 8					0		End of hole at 8.2 m bgl, target depth achieved.
End of Log			9 10 11 12							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MB\_MW05**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **9/10/2013** Total Depth (m): **8.0** Final Water Level (m bgl): **6.676**  
 Drill Finish Date: **19/11/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): **935.314**  
 Drill Co: **Numac** Casing Type: **uPVC** Elevation (Case): **936.029**  
 Driller: **Jared Mudie** Casing Diam. (mm): **50** Easting (MGA): **223711.514**  
 Drill Method: **NDD/PT/SFA** Surface Completion: **Gatic** Northing (MGA): **6305632.182**  
 Hole Type: **Monitoring Well** Water Strike (m bgl): **6.8**

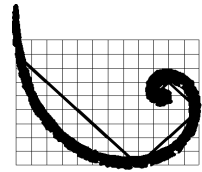
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Gravelly clay with some cobbles, brown, non-plastic, angular gravels and cobbles, some rootlets, no staining, no odour.			0					0		
					DS	Y		0	MB_MW05_0.5	
<b>Fill</b> Sandy clay with some gravel, angular cobbles at 1.5m, grey-brown, non-plastic, angular gravels, no staining, no odour.			1					0		
<b>Fill</b> Sand, pale grey mottled orange, slightly moist, medium to coarse grained, angular, medium stiff, homogenous, no evidence of contamination.			2					0.1		
<b>Fill</b> Sandy clay with some gravel, orange, slightly moist, medium grained angular sands, gravels 20mm (10%), poorly sorted, medium stiff, no evidence of contamination.			2					0.2		
<b>Fill</b> Clay, dark brown-black with red mottling, slightly moist, high plasticity, homogenous, no staining, no odour.			3							
<b>Fill</b> Sandy clay with some gravel and sands, orange, slightly moist, coarse grained angular sands, gravels 20mm (10%), poorly sorted, medium stiff, no evidence of contamination.			4		US	Y		0.2	MB_MW05_3.5	
<b>Fill</b> Sand with fine gravels, pale grey-orange, wet, coarse sub-angular sands, no staining, no odour.			4					0.1		
<b>Fill</b> Clay with some sands and gravels, brown-grey, moist, angular gravels <10mm (20%), homogenous, high plasticity, no staining, no odour.			5					0.3		
<b>Fill</b> Clayey sand with gravels, dark grey-black, becoming grey at 3.7m, slightly moist, angular coal and rounded sandstone gravels <30mm (30%), sands are coarse and angular, homogenous, stiff, non-plastic, no staining, no odour.			5							
<b>Sand</b> With some clay, pale grey-brown, slightly moist, fine to coarse grained, angular to rounded, poorly sorted, homogenous, medium stiff, organic matter (pale			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MB\_MW05**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>9/10/2013</b>	Total Depth (m): <b>8.0</b>	Final Water Level (m bgl): <b>6.676</b>
Drill Finish Date: <b>19/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>935.314</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>936.029</b>
Driller: <b>Jared Mudie</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223711.514</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Gatic</b>	Northing (MGA): <b>6305632.182</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>6.8</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
<p><b>Silt</b>            Grey-brown, becoming yellow-brown at 4.9m with orange-red mottling at 5m, slightly moist, very fine grained, homogenous, low plasticity, medium stiff to soft, high organic matter (roots and rootlets), no staining, no odour.</p> <p><b>Siltstone</b>            Weathered, dark grey with some pale grey and red mottling, very fine grained, homogenous. Pale grey from 6m becoming black at approximately 6.7-6.8m, slightly soft and wet between 6.8-7m, no evidence of contamination.</p>			7							End of hole at 8.0 m bgl, target depth achieved.
End of Log			8							
			9							
			10							
			11							
			12							

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Log By: **T. Shaw**

Checked By: **A. Ashworth**





Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MC\_MW02**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>11/10/2013</b>	Total Depth (m): <b>5.0</b>	Final Water Level (m bgl): <b>2.508</b>
Drill Finish Date: <b>20/11/2013</b>	Hole Diam. / Width (mm): <b>150</b>	Elevation (Ground): <b>939.976</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>939.916</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223655.711</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Gatic</b>	Northing (MGA): <b>6304777.882</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>3.0</b>	

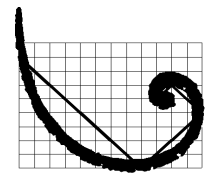
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Concrete</b>			0					0.2		
<b>Fill</b> Gravel, sandy clay intermixed, brown/orange with some grey, moist, soft, medium plasticity, clay increasing with depth.			0.2	■	DS	Y		0.2	MC_MW02_0.3	
<b>Fill</b> Clayey gravelly sand, dark brown, medium dense, loose fine sands, poorly sorted pebbles, sub angular to rounded grains, siltstone cobble inclusions,, no evidence of impact, clay increasing with depth.			1	■	DS	Y		0.4	MC_MW02_1.1	
<b>Gravelly Clay</b> Sand, brown with black and grey mottling, moist, stiff, low plasticity, heterogeneous, shale boulder 2.1 - 2.3m, coal, siltstone and sandstone gravels throughout.			2	■	US	Y		1.1	MC_MW02_2.0	
<b>Clayey Sand</b> Gravel, grey with dark grey and black mottle, moist, dense, fine sand - coarse gravel, moderately sorted, sub-angular to rounded, heterogeneous with quartz and coal gravels throughout, no odour, no staining.			3	■	US	Y		1.4	MC_MW02_3.0	
<b>Coal</b> Black, moist, homogeneous, no odour, no staining										
<b>Clayey Sand</b> Gravel, grey with dark grey and black mottle, moist, dense, fine sand - coarse gravel, moderately sorted, sub-angular to rounded, heterogeneous with quartz and coal gravels throughout, no odour, no staining.			4							
			5							End of hole at 5.0 m bgl, target depth achieved.
End of Log			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MC\_MW03**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>11/10/2013</b>	Total Depth (m): <b>5.0</b>	Final Water Level (m bgl): <b>2.755</b>
Drill Finish Date: <b>19/11/2013</b>	Hole Diam. / Width (mm): <b>150</b>	Elevation (Ground): <b>939.995</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>939.931</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223748.262</b>
Drill Method: <b>NDD/SFA/PT</b>	Surface Completion: <b>Gatic</b>	Northing (MGA): <b>6304746.383</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>3.6</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Concrete</b>			0							
<b>Fill</b> Sandy clay, dark brown/orange, damp, stiff, low plasticity, heterogeneous with sandstone and coal coarse sand to pebbles.			0.1					0.1		
			0.1	■	DS	Y			MC_MW03_0.7	
<b>Fill</b> Gravel/sandy clay, intermixed, brown/orange with some grey, moist, soft, medium plasticity, clay increasing with depth, sandstone, shale, siltstone and coal, fine gravel to cobbles throughout, poorly sorted, sub-angular, no odour, no staining.			1	■	DS	Y		0.2	MC_MW03_1.0	
			0.4					0.4		
<b>Fill</b> Clayey gravelly sand, dark brown, medium dense, loose fine sands, poorly sorted pebbles, sub angular to rounded grains, siltstone cobble inclusions, no evidence of impact, clay increasing with depth.			2					0.4		
<b>Fill</b> Gravelly sandy clay, grey, dark grey and orange brown mottle, moist, stiff, low plasticity, heterogeneous with siltstone, coal and sandstone, fine gravel to pebbles, no odour, no staining.			3					0.4		
			3.6	■	US	Y		0.6	MC_MW03_3.6	
<b>Fill</b> Clayey sandy gravel, dark grey, wet, medium dense, poorly sorted, sub-angular to sub-rounded, homogeneous, fine sands to coarse gravels, no odour, no staining.			4					0.3		
			5							End of hole at 5.0 m bgl, target depth achieved.
End of Log			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MC\_MW04**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>28/10/2013</b>	Total Depth (m): <b>6.2</b>	Final Water Level (m bgl): <b>2.941</b>
Drill Finish Date: <b>31/10/2013</b>	Hole Diam. / Width (mm): <b>150</b>	Elevation (Ground): <b>940.315</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>940.233</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223839.009</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Gatic</b>	Northing (MGA): <b>6304812.685</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>3.6</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks	
Ground Surface			0								
<b>Fill</b> Topsoil, silty sand, brown, dry, medium density, fine to coarse, sands, well sorted, rounded, no evidence of impact.  <b>Fill</b> Silty sand with gravel, brown, dry, dense, fine sand with cobbles poorly sorted coal, siltstone and weathered sandstone inclusions, no evidence of impact.  <b>Fill</b> Clayey sand with gravel, moist, no evidence of impact.  <b>Fill</b> Sandy clay with gravel, brown with orange-brown-grey colouration, medium plasticity, heterogeneous, no evidence of impact.			0		DS	Y		1.4	MC_MW04_0.15		
			1					0.6			
			2					0.5			
			3					0.6			
<b>Sandstone</b> Grey, weathered, moist, medium density, fine to moderately coarse sands, well sorted, minor fine to coarse gravels, becoming wet from 3m.			3		US	Y		1.1	MC_MW04_3.0		
			4					0.9			
			5				0.5				
<b>Clayey Sand</b> Dark grey with gravel inclusions, wet, medium density, fine sand to coarse gravel, poorly sorted, no evidence of impact.			6							End of hole at 6.2 m bgl, target depth achieved.	
End of Log											

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MD\_MW01**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>10/10/2013</b>	Total Depth (m): <b>7.0</b>	Final Water Level (m bgl): <b>3.241</b>
Drill Finish Date: <b>10/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>940.342</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>940.252</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223691.996</b>
Drill Method: <b>NDD/PT/SFA/AH</b>	Surface Completion: <b>Gatic</b>	Northing (MGA): <b>6305167.699</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>5.0</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Sandy Silt</b> Clayey sandy silt, brown, dry, medium stiffness, no plastic, no evidence of impact, with grass roots.			0.3					0.3		
<b>Fill</b> Clayey gravelly sand, dark brown, medium dense, loose fine sands, poorly sorted pebbles, sub angular to rounded grains, siltstone cobble inclusions, no evidence of impact, clay increasing with depth.			0.4	■	DS	Y		0.4	MD_MW01_0.5	
<b>Fill</b> Gravelly sand clay, intermixed, brown/orange with some grey, moist, soft, medium plasticity, clay increasing with depth. Cobbles and gravels of sandstone, shale, siltstone and coal throughout, poorly sorted, sub angular, no evidence of impact.			0.6	■	DS	Y		0.6	MD_MW01_1.0	
<b>Coal</b> Coal, black, hard.			2	■	US	Y		0.1	MD_MW01_2.0	
<b>Siltstone</b> Siltstone, dark grey, dry, hard, no evidence of impact, very fine grained.			3							
<b>Sandstone</b> Sandstone, grey, moist, hard, fine to medium coarse, rounded.			5							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MD\_MW01**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>10/10/2013</b>	Total Depth (m): <b>7.0</b>	Final Water Level (m bgl): <b>3.241</b>
Drill Finish Date: <b>10/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>940.342</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>940.252</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223691.996</b>
Drill Method: <b>NDD/PT/SFA/AH</b>	Surface Completion: <b>Gatic</b>	Northing (MGA): <b>6305167.699</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>5.0</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			7							End of hole at 7.0 m bgl, target depth achieved.
End of Log			8							
			9							
			10							
			11							
			12							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**  
 Page 2 of 2

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MD\_MW02**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **8/11/2013** Total Depth (m): **1.8** Final Water Level (m bgl): -  
 Drill Finish Date: **8/11/2013** Hole Diam. / Width (mm): **300** Elevation (Ground): -  
 Drill Co: **Cardno** Casing Type: **None** Elevation (Case): -  
 Driller: **Simon King** Casing Diam. (mm): - Easting (MGA): **223723**  
 Drill Method: **NDD** Surface Completion: **Backfill** Northing (MGA): **6305173**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Concrete</b>										
<b>Clayey Sand</b> Clayey sand, orange-brown, moist, dense, fine-coarse sand, medium sorted, no evidence of impact.								1.6		
<b>Sandy Clay</b> Sandy clay with gravel, brown, moist, soft, low plasticity heterogeneous, no evidence of impact.					DS	Y		1.6	MD_MW02_0.5	
<b>Clayey Sand</b> Clayey sand with gravel, orange-brown with brown and grey mottle, moist, fine sand-cobbles, poorly sorted, no evidence of impact.			1		DS	Y		1.8	MD_MW02_1.0	
End of Log			2							End of hole at 1.8 m bgl, NDD refusal on cobbles.
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MD\_MW03**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **8/11/2013** Total Depth (m): **4.0** Final Water Level (m bgl): **1.775**  
 Drill Finish Date: **27/11/2013** Hole Diam. / Width (mm): **150** Elevation (Ground): **940.056**  
 Drill Co: **Numac** Casing Type: **uPVC** Elevation (Case): **939.937**  
 Driller: **Jared Mudie** Casing Diam. (mm): **50** Easting (MGA): **223767.709**  
 Drill Method: **NDD/PT/SFA** Surface Completion: **Gatic** Northing (MGA): **6305159.928**  
 Hole Type: **Monitoring Well** Water Strike (m bgl): **2.0**

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Concrete</b>										
<b>Clayey Sand</b> Clayey sand, orange-brown, moist, dense, fine-coarse sand, medium sorted, no evidence of impact.					DS	Y		1.7	MD_MW03_0.3	
<b>Sandy Clay</b> Sandy clay with gravel, brown, moist, soft, low plasticity, heterogeneous, no evidence of impact.								1.4		
<b>Silty Sand</b> Silty sand with gravel, grey, moist, medium dense, fine sand-coarse gravel, medium sorted, quartz, sandstone with coal grace, no evidence of impact										
<b>Sandstone</b> Sandstone boulder								1.5		
<b>Sandy Clay</b> Sandy clay with gravel, orange-brown with grey mottle, moist, soft, high plasticity, heterogeneous with fine sand-boulders, no evidence of impact, grey from 1.1m.					US	Y			MD_MW03_2.0	
<b>Clayey Sand</b> Clayey sand with gravel, dark grey, moist, dense, fine sand-cobbles, poorly sorted, no evidence of impact. Wet layers from 2.0m.										
<b>Sandy Clay</b> Sandy clay with gravel, orange-brown, grey 3.2-3.4m, dark brown 3.4-4.0m, medium stiff, soft 3.6-3.9m, low plasticity, heterogeneous with irregular mottles plus fine gravel-cobbles. No evidence of impact.										
					DS	Y		1.3	MD_MW03_3.8	
End of Log			4							End of hole at 4.0 m bgl, target depth achieved.
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MD\_MW04**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **30/10/2013** Total Depth (m): **6.0** Final Water Level (m bgl): **2.515**  
 Drill Finish Date: **7/11/2013** Hole Diam. / Width (mm): **200** Elevation (Ground): **940.177**  
 Drill Co: **Numac** Casing Type: **uPVC** Elevation (Case): **940.105**  
 Driller: **Jared Mudie** Casing Diam. (mm): **50** Easting (MGA): **223836.307**  
 Drill Method: **NDD/PT/SFA/HFA** Surface Completion: **Gatic** Northing (MGA): **6305157.323**  
 Hole Type: **Monitoring Well** Water Strike (m bgl): **4.0**

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Sandy Silt</b> Sandy silt, brown, damp, medium stiff, no plastic, homogenous, grass roots throughout, no evidence of impact.			0					2		
				■	DS	Y		1.2	MD_MW04_0.5	
<b>Clayey Sand</b> Clayey sand with gravel, dark brown, moist, medium dense, fine sand-cobbles, poorly sorted, heterogeneous, no evidence of impact.			1					1.1		
<b>Sandy Clay</b> Sandy clay with gravel, dark grey-brown, moist, soft, low plasticity, heterogeneous, fine sand-cobbles throughout, Hydrocarbon like odour apparent from about 1.1 m.			1	■	DS	Y		81.7	MD_MW04_1.2	
								15.8		
<b>Clayey Gravel</b> Clayey gravel with sand, dark grey, moist, medium dense, fine sand-cobbles, poorly sorted, heterogeneous, strong hydrocarbon like odour.			2					37		
<b>Sandy Clay</b> Sandy clay with gravel, orange-brown, moist, medium stiff, moderate plasticity, heterogeneous. Hydrocarbon like odour (strong to 2m), grey between 1.5 - 2m, brown 2-4m.			3	■	US	Y		2	MD_MW04_3.0	
								1.3		
<b>Sandy Gravel</b> Sandy gravel, black, wet fine sand-coarse gravel.			4					1.2		
			5							
			6							End of hole at 6.0 m bgl, target depth achieved.
End of Log										

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ME\_MW04**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **14/11/2013** Total Depth (m): **9.0** Final Water Level (m bgl): **5.485**  
 Drill Finish Date: **21/11/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): **936.644**  
 Drill Co: **Numac** Casing Type: **uPVC** Elevation (Case): **936.569**  
 Driller: **Jared Mudie** Casing Diam. (mm): **50** Easting (MGA): **224054.715**  
 Drill Method: **NDD/PT/SFA** Surface Completion: **Gatic** Northing (MGA): **6305279.551**  
 Hole Type: **Monitoring Well** Water Strike (m bgl): **5.5**

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Asphalt</b> Good condition, no staining.			0					0.4		
<b>Fill</b> Gravelly sand, pale brown, dry, coarse angular gravels <70mm (30%), poorly sorted, no evidence of contamination.			0.3		DS	Y		0.3	ME-MW04-0.5	
<b>Fill</b> Gravel with some clay and sand, dark brown-black, fine to coarse angular gravels (5 - 75mm), and cobbles (200mm), poorly sorted, no evidence of contamination.			1					0.8		
<b>Fill</b> Gravelly clay, brown with orange-red mottling, dry, angular shale and sandstone gravels <30mm (30%), poorly sorted, stiff, no evidence of contamination. Shale cobble between 2.3 - 2.4m.			2							
<b>Fill</b> Gravelly clay, dark brown-grey, angular shale and rare siltstone gravels <50mm (50%), poorly sorted, homogenous, stiff, no evidence of contamination.			3		US	Y		0.5	ME_MW04_2.5	
<b>Clay</b> With some gravels, dark brown with grey and orange mottling from 4m, slightly moist, becoming wet at 5.5m, some very fine black gravels <4mm (10%), angular, very stiff, homogenous, rare coal and shale gravels at 9m, no evidence of contamination.			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: ME\_MW04**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>14/11/2013</b>	Total Depth (m): <b>9.0</b>	Final Water Level (m bgl): <b>5.485</b>
Drill Finish Date: <b>21/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>936.644</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>936.569</b>
Driller: <b>Jared Mudie</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224054.715</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Gatic</b>	Northing (MGA): <b>6305279.551</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>5.5</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			7							
			8					0.7		
			9							End of hole at 9.0 m bgl, target depth achieved.
End of Log			10							
			11							
			12							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**  
 Page 2 of 2

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ME\_SB01**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **14/11/2013** Total Depth (m): **1.5** Final Water Level (m bgl): -  
 Drill Finish Date: **14/11/2013** Hole Diam. / Width (mm): **300** Elevation (Ground): -  
 Drill Co: **Cardno** Casing Type: **None** Elevation (Case): -  
 Driller: **Simon King** Casing Diam. (mm): - Easting (MGA): **224044**  
 Drill Method: **NDD** Surface Completion: **Backfill** Northing (MGA): **6305318**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Topsoil</b> Clay, dark brown, dry, fine grained, homogenous, organic matter (root/rootlets). <b>Fill</b> Gravelly clay, orange, dry, poorly sorted, round angular gravels <20mm (40%), no evidence of contamination. <b>Fill</b> Gravelly clay, dark brown, dry, rounded angular gravels <20mm (40%), poorly sorted, some coal gravels and cobbles from 0.6m. No evidence of contamination.			0.2					0.2		
			0.1		DS	Y		0.1	ME-MW01-0.5	
			1							
End of Log			2							
			3							
			4							
			5							
			6							

End of hole at 1.5 m bgl, hole abandoned due to concurrent investigation by others.

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ME\_SB02**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **14/11/2013** Total Depth (m): **1.5** Final Water Level (m bgl): -  
 Drill Finish Date: **14/11/2013** Hole Diam. / Width (mm): **300** Elevation (Ground): -  
 Drill Co: **Cardno** Casing Type: **None** Elevation (Case): -  
 Driller: **Simon King** Casing Diam. (mm): - Easting (MGA): **224075**  
 Drill Method: **NDD** Surface Completion: **Concrete** Northing (MGA): **6305324**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Gravelly clay, dark grey-black, dry, coal gravels, coarse and angular, no staining.								0.3		
<b>Fill</b> Clay with fine angular gravels, orange, 30% gravels, poorly sorted, no evidence of contamination.					DS	Y		0	ME_MW02_0.5	
<b>Fill</b> Gravelly clay, brown, fine to coarse angular gravel and cobbles, poorly sorted. No evidence of contamination.			1					0		
<b>Clay</b> With rare, fine angular gravels, brown mottled orange and red, medium stiff, high plasticity, homogenous, organic matter (black). No evidence of contamination. Some coarse ground angular sand at 1.0m.										
End of Log			2							
			3							
			4							
			5							
			6							

End of hole at 1.5 m bgl, hole abandoned due to concurrent investigation by others.

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ME\_SB03**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **14/11/2013** Total Depth (m): **1.5** Final Water Level (m bgl): -  
 Drill Finish Date: **14/11/2013** Hole Diam. / Width (mm): **300** Elevation (Ground): -  
 Drill Co: **Cardno** Casing Type: **None** Elevation (Case): -  
 Driller: **Simon King** Casing Diam. (mm): - Easting (MGA): **224101**  
 Drill Method: **NDD** Surface Completion: **Concrete** Northing (MGA): **6305266**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Gravelly sand with some gravels, pale brown, dry, gravels are approximately 20mm (20%). Sands are medium, coarse grained, rounded to angular, poorly sorted, homogenous, no evidenced contamination.			0.3		DS	Y		0.3	ME-MW03-0.5	End of hole at 1.5 m bgl, hole abandoned due to concurrent investigation by others.
<b>Fill</b> Gravelly sand with some clay, brown, medium to coarse sands, round to angular, poorly sorted, gravels are angular (5 - 75mm), shale and coal cobbles (75 - 150mm). No evidence of contamination. Cobbles increasing with depth.			1					0.6		
<b>Fill</b> Gravelly clay with some sand, brown, angular gravel and cobbles <150mm, rounded, medium grained sands, no evidence of contamination, low plasticity. Interlocked Cobbles from 1.1m			2							
End of Log			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MF\_MW01**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>30/10/2013</b>	Total Depth (m): <b>16.0</b>	Final Water Level (m bgl): <b>15.638</b>
Drill Finish Date: <b>12/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>951.466</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>952.094</b>
Driller: <b>Cole Manger</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224249.559</b>
Drill Method: <b>NDD</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304731.168</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>14.5</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Clayey Gravel</b> Clayey gravel with cobbles, dark brown, dry, poorly sorted, coarse gravels <75mm, cobbles <150mm (50%) angular, no odour, no staining.			0		DS	Y		0.2	MF_MW01_0.2	
<b>Shale</b> Dark grey, dry, hard, homogenous, no evidence of impact			1							
<b>Siltstone</b> Light grey, dry, hard, very fine grained, homogenous, no evidence of impact, slightly moist and grey from 3.5m, dry from 5m, dark grey from 7m, light grey 13.5m.			2							
			3							
			4							
			5							
			6							

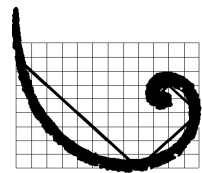
**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MF\_MW01**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>30/10/2013</b>	Total Depth (m): <b>16.0</b>	Final Water Level (m bgl): <b>15.638</b>
Drill Finish Date: <b>12/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>951.466</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>952.094</b>
Driller: <b>Cole Manger</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224249.559</b>
Drill Method: <b>NDD</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304731.168</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>14.5</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			7							
			8							
			9							
			10							
			11							
			12							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**  
 Page 2 of 3

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MF\_MW01**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>30/10/2013</b>	Total Depth (m): <b>16.0</b>	Final Water Level (m bgl): <b>15.638</b>
Drill Finish Date: <b>12/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>951.466</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>952.094</b>
Driller: <b>Cole Manger</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224249.559</b>
Drill Method: <b>NDD</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304731.168</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>14.5</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			13							
			14							
<b>Coal</b> Black, wet, homogenous.			15							
			16							End of hole at 16.0 m bgl, target depth achieved.
End of Log			17							
			18							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**  
 Page 3 of 3



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MF\_MW02**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>30/10/2013</b>	Total Depth (m): <b>25.0</b>	Final Water Level (m bgl): <b>15.387</b>
Drill Finish Date: <b>12/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>951.85</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>952.537</b>
Driller: <b>Cole Manger</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224272.296</b>
Drill Method: <b>NDD/AH</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304731.440</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>23.0</b>	

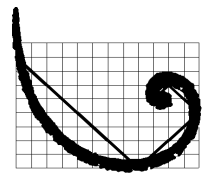
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Clayey Gravel</b> Dark brown-grey, dry, non plastic, gravels 2 -75mm, gravels are dark grey-black shale, angular, poorly sorted, no staining, no odour, rootlets.			0		DS	Y		0	MF_MW02_0.1	
<b>Shale</b> Shale, dark grey, dry, hard, homogenous, no evidence of impact			1							
<b>Silty Clay</b> Orange brown, moist, soft, low plasticity, homogenous, no evidence of impact.			1							
<b>Coal</b> Coal, black, dry, hard, no evidence of impact, homogenous.			2							
<b>Shale</b> Dark grey, very fine grained, homogenous, no evidence of impact.			3							
<b>Siltstone</b> Light grey, dry, hard, very fine grained, homogenous, no evidence of impact.			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MF\_MW02**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>30/10/2013</b>	Total Depth (m): <b>25.0</b>	Final Water Level (m bgl): <b>15.387</b>
Drill Finish Date: <b>12/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>951.85</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>952.537</b>
Driller: <b>Cole Manger</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224272.296</b>
Drill Method: <b>NDD/AH</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304731.440</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>23.0</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
<b>Sandstone</b> Grey, moist, fine coarse, grained, poorly sorted, no evidence of impact.			7							
<b>Siltstone</b> Light grey, becoming grey from 11m, moist, becoming dry from 8m, very fine grained, homogenous, no evidence of impact.			8							
			9							
			10							
			11							
			12							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MF\_MW02**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>30/10/2013</b>	Total Depth (m): <b>25.0</b>	Final Water Level (m bgl): <b>15.387</b>
Drill Finish Date: <b>12/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>951.85</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>952.537</b>
Driller: <b>Cole Manger</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224272.296</b>
Drill Method: <b>NDD/AH</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304731.440</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>23.0</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			13							
			14							
			15							
			16							
			17							
<b>Coal</b> Black, dry, homogenous, interbedded with grey, dry, siltstone from 18m.			18							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MF\_MW02**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>30/10/2013</b>	Total Depth (m): <b>25.0</b>	Final Water Level (m bgl): <b>15.387</b>
Drill Finish Date: <b>12/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>951.85</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>952.537</b>
Driller: <b>Cole Manger</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224272.296</b>
Drill Method: <b>NDD/AH</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304731.440</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>23.0</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			19							
<b>Sandstone</b> Grey, moist, fine sand to coarse gravel, moderately sorted, rounded grains, no evidence of impact.			20							
<b>Sandstone</b> Grey, moist, becoming wet at 23m, fine sand to coarse gravel, moderately sorted, rounded grains, interbedded with black coal, no evidence of impact.			21							
			22							
			23							
			24							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**  
 Page 4 of 5

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MF\_MW02**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>30/10/2013</b>	Total Depth (m): <b>25.0</b>	Final Water Level (m bgl): <b>15.387</b>
Drill Finish Date: <b>12/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>951.85</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>952.537</b>
Driller: <b>Cole Manger</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224272.296</b>
Drill Method: <b>NDD/AH</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304731.440</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>23.0</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			25							End of hole at 25.0 m bgl, target depth achieved.
End of Log			26							
			27							
			28							
			29							
			30							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**  
 Page 5 of 5



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MF\_MW03**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>30/10/2013</b>	Total Depth (m): <b>13.0</b>	Final Water Level (m bgl): <b>9.177</b>
Drill Finish Date: <b>11/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>954.439</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>955.123</b>
Driller: <b>Cole Manger</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224274.563</b>
Drill Method: <b>NDD</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304653.579</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>11.0</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Clayey Gravel</b> Dark brown-grey, dry, non plastic, gravels 1- 30mm, angular, poorly sorted, no staining, no odour.			0		DS	Y		0	MF_MW03_0.2	
<b>Shale</b> Dark grey, becoming light grey from 1.5m interbedded with coal, dry, hard.			1							
<b>Siltstone</b> Grey, moist, becoming dry between 3 - 4.5m, very fine grained, homogenous.			2							
<b>Coal</b> Coal, black, dry, homogenous			3							
<b>Shale</b> Black, very fine grained, dry, homogenous.			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MF\_MW03**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>30/10/2013</b>	Total Depth (m): <b>13.0</b>	Final Water Level (m bgl): <b>9.177</b>
Drill Finish Date: <b>11/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>954.439</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>955.123</b>
Driller: <b>Cole Manger</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224274.563</b>
Drill Method: <b>NDD</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304653.579</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>11.0</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			7							
			8							
<b>Siltstone</b> Dark grey, very fine grained, dry, homogenous.			9							
<b>Siltstone</b> Pale grey with some dark grey laminations and some black grains, slightly moist, very fine grained.			10							
<b>Sandstone</b> Grey, moist, fine to coarse grained, poorly sorted, well rounded, homogenous, no stains, no odour.			11							
			12							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MF\_MW03**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>30/10/2013</b>	Total Depth (m): <b>13.0</b>	Final Water Level (m bgl): <b>9.177</b>
Drill Finish Date: <b>11/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>954.439</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>955.123</b>
Driller: <b>Cole Manger</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224274.563</b>
Drill Method: <b>NDD</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304653.579</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>11.0</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
<b>Siltstone</b> Pale grey, very fine grained, homogenous, slightly moist.			13							End of hole at 13.0 m bgl, target depth achieved.
End of Log			14							
			15							
			16							
			17							
			18							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**  
 Page 3 of 3

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MF\_MW04**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>30/10/2013</b>	Total Depth (m): <b>16.0</b>	Final Water Level (m bgl): <b>12.420</b>
Drill Finish Date: <b>13/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>949.193</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>949.193</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224257.943</b>
Drill Method: <b>NDD/AH</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304808.021</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>12.0</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Clayey Gravel</b> With cobbles, dark brown, dry, poorly sorted, angular gravels <75mm, cobbles <150mm (30%), no staining, no odour, rootlets.			0		DS	Y		0	MF_MW04_0.2	
<b>Shale</b> Dark grey, homogenous, no evidence of impact.			1							
<b>Siltstone</b> Orange brown, moist, soft, homogenous, no evidence of impact.			2							
<b>Siltstone</b> Pale grey, very fine grained, homogenous, no evidence of impact.			3							
<b>Siltstone</b> Weathered, (returns as clay), dark grey-black, wet, soft, homogenous, no odour.			4							
<b>Siltstone</b> Orange-brown, moist, becoming grey at 3m, and dark grey and dry at 4.5m, homogenous, very fine grained. no staining, no odour. Some weathering (layered orange and black, and grey clay) and organic matter (roots) between 3 - 4.5m.			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MF\_MW04**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>30/10/2013</b>	Total Depth (m): <b>16.0</b>	Final Water Level (m bgl): <b>12.420</b>
Drill Finish Date: <b>13/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>949.193</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>949.193</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224257.943</b>
Drill Method: <b>NDD/AH</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304808.021</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>12.0</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
<b>Shale</b> Dark grey-black, dry, hard, very fine grained, layered, homogenous, no evidence of impact.			7							
<b>Siltstone</b> Dark grey, very fine grained, with some minor pale grey laminations, slightly moist. Becoming dark grey-black at 10m.			8							
			9							
			10							
			11							
<b>Shale</b> Shale, dark grey-black, dry, layered, homogenous			12							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MF\_MW04**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>30/10/2013</b>	Total Depth (m): <b>16.0</b>	Final Water Level (m bgl): <b>12.420</b>
Drill Finish Date: <b>13/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>949.193</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>949.193</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224257.943</b>
Drill Method: <b>NDD/AH</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304808.021</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>12.0</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
<b>Coal</b> Coal, black, wet, no odour.			13							
<b>Siltstone</b> Dark grey, slightly moist, very fine grained, homogenous, no evidence of impact.			14							
<b>Sandstone</b> Grey, slightly moist, fine-grained, sub-angular to rounded, homogenous.			15							
End of Log			16							End of hole at 16.0 m bgl, target depth achieved.
			17							
			18							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MF\_MW05**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>30/10/2013</b>	Total Depth (m): <b>29.0</b>	Final Water Level (m bgl): <b>26.522</b>
Drill Finish Date: <b>30/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>949.780</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>950.365</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224291.098</b>
Drill Method: <b>NDD/AH</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304810.570</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>-</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Clayey Gravel</b> Dark brown, dry, angular gravel <75mm, cobbles <150mm (30%), poorly sorted, no staining, no odour.			0		DS	Y		0	MF_MW05_0.2	
<b>Shale</b> Dark grey-black, hard, dry, homogenous, no evidence of contamination.			1							
<b>Coal</b> Black, dry, homogenous.			2							
<b>Shale</b> Dark grey-black, dry, layered, hard, homogenous, no evidence of impact.			3							
<b>Siltstone</b> Grey, dry, very fine grained, homogenous. Becoming pale grey at 5m with some dark, grey laminations, moist at 6m, very fine grained, homogenous. Becoming drier at 8m, no evidence of impact.		4								
		5								
		6								

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MF\_MW05**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>30/10/2013</b>	Total Depth (m): <b>29.0</b>	Final Water Level (m bgl): <b>26.522</b>
Drill Finish Date: <b>30/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>949.780</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>950.365</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224291.098</b>
Drill Method: <b>NDD/AH</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304810.570</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>-</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			7							
			8							
			9							
<b>Shale</b> Dark grey, dry, very fine grained, layered, homogenous.			10							
			11							
<b>Siltstone</b> Dark grey, dry, homogenous, very fine grained.			12							

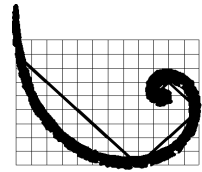
**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MF\_MW05**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>30/10/2013</b>	Total Depth (m): <b>29.0</b>	Final Water Level (m bgl): <b>26.522</b>
Drill Finish Date: <b>30/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>949.780</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>950.365</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224291.098</b>
Drill Method: <b>NDD/AH</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304810.570</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>-</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			13							
			14							
<b>Shale</b> Dark grey, dry, hard, homogenous, very fine grained.			15							
			16							
			17							
<b>Coal</b> Black			18							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**  
 Page 3 of 5

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MF\_MW05**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>30/10/2013</b>	Total Depth (m): <b>29.0</b>	Final Water Level (m bgl): <b>26.522</b>
Drill Finish Date: <b>30/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>949.780</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>950.365</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224291.098</b>
Drill Method: <b>NDD/AH</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304810.570</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>-</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
<b>Siltstone</b> Grey-pale brown, dry, very fine grained, homogenous, interbedded with dark grey siltstone at 19.5m.			19							
<b>Sandstone</b> Pale grey, slightly moist, fine to medium grained with some coarse grains, rounded, homogenous, no evidence of impact. Coarse grained angular sand at 23m.			20							
			21							
			22							
			23							
			24							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MF\_MW05**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>30/10/2013</b>	Total Depth (m): <b>29.0</b>	Final Water Level (m bgl): <b>26.522</b>
Drill Finish Date: <b>30/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>949.780</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>950.365</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224291.098</b>
Drill Method: <b>NDD/AH</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304810.570</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>-</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
<b>Coal</b> Black, interbedded with sandstone from 24.5 - 25m. Interbedded with siltstone from 26.7 - 27.1m.			25							
<b>Siltstone</b> Dark grey, dry, very fine grained, hard, homogenous.			28							
<b>Siltstone</b> Pale grey with some black grains, dry, very fine grained.			28							
<b>Sandstone</b> Pale grey, very fine grained, moist, poorly sorted, angular to rounded.			29							End of hole at 29.0 m bgl, target depth achieved.
End of Log			30							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MG\_SB02**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>13/11/2013</b>	Total Depth (m): <b>0.45</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>13/11/2013</b>	Hole Diam. / Width (mm): <b>400</b>	Elevation (Ground): -
Drill Co: <b>Cardno</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Simon King</b>	Casing Diam. (mm): -	Easting (MGA): <b>225268</b>
Drill Method: <b>NDD</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6305066</b>
Hole Type: <b>Soil Bore</b>	Water Strike (m bgl): -	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Silty sand with gravel, light brown, dry, dense, fine sand to cobbles comprising shale, siltstone and sandstone, poorly sorted, sub-angular to rounded, no odour, no staining.			0		DS	Y		0.8	MG_SB02_0.1	End of hole at 0.45 m bgl, NDD refusal on boulders.
End of Log			1							
			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MG\_SB03**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>13/11/2013</b>	Total Depth (m): <b>0.45</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>13/11/2013</b>	Hole Diam. / Width (mm): <b>400</b>	Elevation (Ground): -
Drill Co: <b>Cardno</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Simon King</b>	Casing Diam. (mm): -	Easting (MGA): <b>225028</b>
Drill Method: <b>NDD</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6304699</b>
Hole Type: <b>Soil Bore</b>	Water Strike (m bgl): -	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Silty sand with gravel, cobbles, siltstone and shale throughout, light brown, dry, dense, fine grained, poorly sorted, sub-angular to rounded, no evidence of impact.  End of Log			0		DS	Y	1	MG_SB03_0.2	End of hole at 45 m bgl, NDD refusal on boulders.	
			1							
			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MH\_MW01**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>13/11/2013</b>	Total Depth (m): <b>30.0</b>	Final Water Level (m bgl): <b>24.390</b>
Drill Finish Date: <b>18/11/2013</b>	Hole Diam. / Width (mm): <b>150</b>	Elevation (Ground): <b>938.987</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>939.597</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>225033.028</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304574.317</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>26.0</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Coal, shale gravel, dark grey - black, dry, very loose, fine grave to pebbles, poorly sorted, sub-angular, no odour, no staining.			0		DS	Y		2	MH_MW01_0.2	
<b>Fill</b> Sandy clay with gravel, dark brown, moist, soft, low plasticity, heterogeneous with fine sand to coarse gravel inclusions throughout, no odour, no staining.			0.4					0.4		
<b>Fill</b> Gravel with sandy clay, sandy clay dark brown with orange and grey mottle, gravel red - brown, brown, black, grey and light brown, moist, dense, coarse gravel to boulders, poorly sorted, sub-angular to sub-rounded, no odour, no staining.			0.9					0.9		
			1					0.3		
			2					0.2		
			3					0.2		
			4					0.2		
			5					0.2		
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MH\_MW01**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>13/11/2013</b>	Total Depth (m): <b>30.0</b>	Final Water Level (m bgl): <b>24.390</b>
Drill Finish Date: <b>18/11/2013</b>	Hole Diam. / Width (mm): <b>150</b>	Elevation (Ground): <b>938.987</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>939.597</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>225033.028</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304574.317</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>26.0</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
								0.1		
<b>Sandy Clay</b> Dark brown, moist, soft, moderate plasticity, homogeneous, no odour, no staining.			7							
<b>Sandy Clay</b> Gravel, coal gravels, siltstone and sandstones gravel from 18 m, black, moist, soft, high plasticity, homogeneous, no odour, no staining.			8		DS	Y		0.1	MH_MW01_8.0	
			9							
			10					0.1		
			11							
			12							

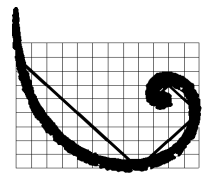
**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MH\_MW01**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>13/11/2013</b>	Total Depth (m): <b>30.0</b>	Final Water Level (m bgl): <b>24.390</b>
Drill Finish Date: <b>18/11/2013</b>	Hole Diam. / Width (mm): <b>150</b>	Elevation (Ground): <b>938.987</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>939.597</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>225033.028</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304574.317</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>26.0</b>	

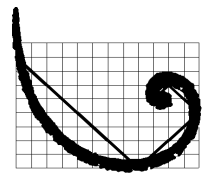
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			13							
			14							
			15					0.2		
			16							
			17							
			18							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MH\_MW01**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>13/11/2013</b>	Total Depth (m): <b>30.0</b>	Final Water Level (m bgl): <b>24.390</b>
Drill Finish Date: <b>18/11/2013</b>	Hole Diam. / Width (mm): <b>150</b>	Elevation (Ground): <b>938.987</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>939.597</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>225033.028</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304574.317</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>26.0</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			19							
			20					0.2		
			21							
			22							
			23							
			24							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MH\_MW01**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>13/11/2013</b>	Total Depth (m): <b>30.0</b>	Final Water Level (m bgl): <b>24.390</b>
Drill Finish Date: <b>18/11/2013</b>	Hole Diam. / Width (mm): <b>150</b>	Elevation (Ground): <b>938.987</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>939.597</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>225033.028</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304574.317</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>26.0</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			25					0.2		
			26	■	DS	Y		0.7	MH_MW01_26.0	
			27							
			28							
			29							
			30							End of hole at 30.0 m bgl, target depth achieved.
End of Log										

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MH\_MW02**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>13/11/2013</b>	Total Depth (m): <b>15.5</b>	Final Water Level (m bgl): <b>11.551</b>
Drill Finish Date: <b>19/11/2013</b>	Hole Diam. / Width (mm): <b>150</b>	Elevation (Ground): <b>935.579</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>935.510</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224961.537</b>
Drill Method: <b>NDD/SFA</b>	Surface Completion: <b>Gatic</b>	Northing (MGA): <b>6304377.109</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>12.5</b>	

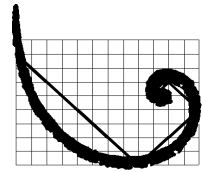
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Silty sand with gravel, shale, sandstone and siltstone throughout, light brown, dry, dense, fine sands - cobbles, poorly sorted, sub-angular to rounded, plant roots, no odour, no staining.			0		DS	Y		1.5	MH_MW02_0.2	
			0.1					0.1		
			1					0.1		
			2					0.1		
<b>Siltstone</b> Grey, dry, hard, fine grained, well sorted, no odour, no staining.			4					0.2		
			5							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MH\_MW02**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>13/11/2013</b>	Total Depth (m): <b>15.5</b>	Final Water Level (m bgl): <b>11.551</b>
Drill Finish Date: <b>19/11/2013</b>	Hole Diam. / Width (mm): <b>150</b>	Elevation (Ground): <b>935.579</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>935.510</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224961.537</b>
Drill Method: <b>NDD/SFA</b>	Surface Completion: <b>Gatic</b>	Northing (MGA): <b>6304377.109</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>12.5</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
<b>Shale</b> Interbedded with grey fine grained, hard siltstone from 9m, dark grey, dry, moderate to hard, fine grained, well sorted, no odour, no staining,			7 8 9 10 11 12					0.8		
					DS	Y			MH_MW02_12.0	

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MH\_MW02**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>13/11/2013</b>	Total Depth (m): <b>15.5</b>	Final Water Level (m bgl): <b>11.551</b>
Drill Finish Date: <b>19/11/2013</b>	Hole Diam. / Width (mm): <b>150</b>	Elevation (Ground): <b>935.579</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>935.510</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224961.537</b>
Drill Method: <b>NDD/SFA</b>	Surface Completion: <b>Gatic</b>	Northing (MGA): <b>6304377.109</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>12.5</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
<b>Coal</b> Interbedded with shale dark grey shale from 13.5 m, black, dry, hard, homogeneous, no odour, no staining			13							
<b>Sandstone</b> Grey, dry, hard, fine to medium coarse sands, well sorted, no odour, no staining.			14							
			15							End of hole at 15.5 m bgl, target depth achieved.
End of Log			16							
			17							
			18							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MH\_MW03**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>13/11/2013</b>	Total Depth (m): <b>28.5</b>	Final Water Level (m bgl): <b>18.708</b>
Drill Finish Date: <b>14/11/2013</b>	Hole Diam. / Width (mm): <b>150</b>	Elevation (Ground): <b>928.411</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>928.365</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>225497.112</b>
Drill Method: <b>NDD/SFA</b>	Surface Completion: <b>Gatic</b>	Northing (MGA): <b>6304938.047</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>18.0</b>	

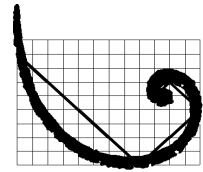
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks	
Ground Surface			0								
<b>Fill</b> Silty sand with gravel, shale sandstone and siltstone throughout dry, light brown, dark from 0.4m, damp from 0.4m, dense, fine sands to cobbles, poorly sorted, sub-angular to rounded, no odour, no staining.			0			Y		0.2	MH_MW03_0.2		
			0.4								
			1			Y		0.6	MH_MW03_1.0		
			2						0.2		
			2					0.4			
			3								
			4								
			5								
			6								

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MH\_MW03**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>13/11/2013</b>	Total Depth (m): <b>28.5</b>	Final Water Level (m bgl): <b>18.708</b>
Drill Finish Date: <b>14/11/2013</b>	Hole Diam. / Width (mm): <b>150</b>	Elevation (Ground): <b>928.411</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>928.365</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>225497.112</b>
Drill Method: <b>NDD/SFA</b>	Surface Completion: <b>Gatic</b>	Northing (MGA): <b>6304938.047</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>18.0</b>	

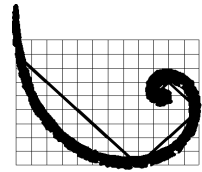
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			7							
			8							
			9							
			10					0.3		
			11							
			12							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**  
 Page 2 of 5

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MH\_MW03**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>13/11/2013</b>	Total Depth (m): <b>28.5</b>	Final Water Level (m bgl): <b>18.708</b>
Drill Finish Date: <b>14/11/2013</b>	Hole Diam. / Width (mm): <b>150</b>	Elevation (Ground): <b>928.411</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>928.365</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>225497.112</b>
Drill Method: <b>NDD/SFA</b>	Surface Completion: <b>Gatic</b>	Northing (MGA): <b>6304938.047</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>18.0</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
<b>Sandy Clay</b> Gravel, dark brown, moist, soft, non-plastic, heterogeneous, no odour, no staining.			13							
			14							
			15					0.2		
			16							
			17							
			18			Y			MH_MW03_18.0	

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MH\_MW03**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>13/11/2013</b>	Total Depth (m): <b>28.5</b>	Final Water Level (m bgl): <b>18.708</b>
Drill Finish Date: <b>14/11/2013</b>	Hole Diam. / Width (mm): <b>150</b>	Elevation (Ground): <b>928.411</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>928.365</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>225497.112</b>
Drill Method: <b>NDD/SFA</b>	Surface Completion: <b>Gatic</b>	Northing (MGA): <b>6304938.047</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>18.0</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			19							
			20					0.1		
			21							
			22							
			23							
			24							

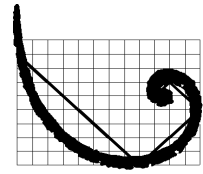
**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MH\_MW03**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>13/11/2013</b>	Total Depth (m): <b>28.5</b>	Final Water Level (m bgl): <b>18.708</b>
Drill Finish Date: <b>14/11/2013</b>	Hole Diam. / Width (mm): <b>150</b>	Elevation (Ground): <b>928.411</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>928.365</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>225497.112</b>
Drill Method: <b>NDD/SFA</b>	Surface Completion: <b>Gatic</b>	Northing (MGA): <b>6304938.047</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>18.0</b>	

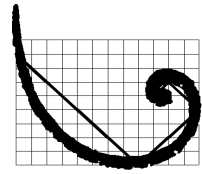
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
<b>Sandy Clay</b> Grey, moist, soft, moderate plasticity, homogeneous, no odour, no staining.			25 26 27 28					0.3		End of hole at 28.5 m bgl, target depth achieved.
End of Log			29 30							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MH\_SB04**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>13/11/2013</b>	Total Depth (m): <b>0.65</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>13/11/2013</b>	Hole Diam. / Width (mm): <b>400</b>	Elevation (Ground): -
Drill Co: <b>Cardno</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Simon King</b>	Casing Diam. (mm): -	Easting (MGA): <b>225026</b>
Drill Method: <b>NDD</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6304617</b>
Hole Type: <b>Soil Bore</b>	Water Strike (m bgl): -	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Gravelly sandy clay, fine gravel to cobbles, dark grey - brown, wet, soft, low plasticity, heterogeneous, no odour, no staining					DS	Y		1.3	MH_SB04_0.1	
								0.4		End of hole at 0.65 m bgl, NDD refusal on cobbles.
End of Log			1							
			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MI\_SB02**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>30/09/2013</b>	Total Depth (m): <b>0.8</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>30/09/2013</b>	Hole Diam. / Width (mm): <b>300</b>	Elevation (Ground): -
Drill Co: <b>Cardno</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Nathan Kelleher</b>	Casing Diam. (mm): -	Easting (MGA): <b>224311</b>
Drill Method: <b>NDD</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6305284</b>
Hole Type: <b>Soil Bore</b>	Water Strike (m bgl): -	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Clayey gravel with cobbles (30%), orange-brown, becoming dark brown at 0.3m, dry, non plastic, medium to coarse gravels <50mm, cobbles 300mm, poorly sorted, angular, no staining, no odour, rootlets.			0		DS	Y		0.4	MI_SB02_0.2	End of hole at 0.8 m bgl, NDD refusal on cobbles.
								0.1		
End of Log			1							
			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MI\_SB03**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **1/11/2013** Total Depth (m): **3.0** Final Water Level (m bgl): -  
 Drill Finish Date: **21/11/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Jared Mudie** Casing Diam. (mm): - Easting (MGA): **224265**  
 Drill Method: **NDD/PT** Surface Completion: **Backfill** Northing (MGA): **6305247**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Clayey gravel, dark brown, dry, non-plastic, poorly sorted coarse gravels and cobbles <150mm, angular, no staining, no odour.			0		DS	Y		0	MI_SB03_0.2	
<b>Fill</b> Gravelly clay, dark brown, dry, non plastic, poorly sorted, fine to coarse gravels, angular, homogenous, no evidence of contamination			0							
<b>Fill</b> Clay, orange with grey mottles, slightly moist, rare fine gravels <5mm, angular, homogenous, medium plasticity, no evidence of contamination.			1					0.4		
<b>Fill</b> Gravelly clay with cobbles, brown, with orange mottles, fine (30%) angular black gravels, siltstone cobbles, very stiff, poorly sorted, dry, no evidence of contamination. Siltstone cobble between 1.4 - 1.8 m, gravels increase in size (20mm) from 2m.			2							
			3		US	Y		0	MI_SB03_2.8	End of hole at 3.0 m bgl, target depth achieved.
End of Log			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MI\_SB04**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **9/10/2013** Total Depth (m): **3.0** Final Water Level (m bgl): -  
 Drill Finish Date: **21/11/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Jared Mudie** Casing Diam. (mm): - Easting (MGA): **224384**  
 Drill Method: **NDD/PT** Surface Completion: **Backfill** Northing (MGA): **6305325**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Clayey gravel, dry, pale brown, angular gravels, no staining, no odour  <b>Fill</b> Coal gravel with some cobbles, black, dry, angular, no odour, no staining, no odour.			0		DS	Y		0.1	MI_SB04_0.2	
<b>Fill</b> Clay with coal gravel, dark grey with orange mottles, moist, soft, medium plasticity, no staining, no odour.  <b>Fill</b> Coal gravel with some sand and cobbles, black, dry, angular, no odour, coarse angular grey sand, shale, coal and some sandstone gravels from 2.6 - 3m, no staining, no odour.			2		US	Y			MI_SB04_2.1	
End of Log			3							End of hole at 3.0 m bgl, target depth achieved.
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MI\_SB05**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **30/10/2013** Total Depth (m): **0.8** Final Water Level (m bgl): -  
 Drill Finish Date: **30/10/2013** Hole Diam. / Width (mm): **200** Elevation (Ground): -  
 Drill Co: **Cardno** Casing Type: **None** Elevation (Case): -  
 Driller: **Nathan Kelleher** Casing Diam. (mm): - Easting (MGA): **224325**  
 Drill Method: **NDD** Surface Completion: **Backfill** Northing (MGA): **6305212**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Clayey gravels with cobbles, brown, dry, poorly sorted, gravels <75mm, cobbles<150mm (50%), angular, no stains, no odour, rootlets.					DS	Y		0.3	MI_SB05_0.2	
<b>Fill</b> Clayey gravel with cobbles, pale brown, poorly sorted gravels <75mm, angular shale cobbles <150mm.								0.6		End of hole at 3.0 m bgl, NDD refusal on shale cobbles.
<b>Fill</b> Sandy clay, orange-brown, medium plasticity, homogenous, no staining, no odour.			1							
End of Log			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MI\_SB06**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **1/11/2013** Total Depth (m): **3.0** Final Water Level (m bgl): -  
 Drill Finish Date: **21/11/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Jared Mudie** Casing Diam. (mm): - Easting (MGA): **224207**  
 Drill Method: **NDD/PT** Surface Completion: **Backfill** Northing (MGA): **6305189**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Gravelly clay with sand, brown, dry, poorly sorted, medium to coarse angular gravels <75mm, rootlets, no evidence of contamination.			0		DS	Y		0	MI_SB06_0.2	
<b>Fill</b> Gravel with clay and sand, dark brown, poorly sorted, coarse angular gravels <75mm, no evidence of contamination.			0					0		
<b>Fill</b> Gravelly clay, dark brown, fine to coarse gravels <40mm (20%), poorly sorted, angular gravels consisting sandstone, shale and coal, high plasticity clay, no evidence of contamination. Siltstone cobble between 1.1 - 1.4m.			1		DS	Y		0	MI_SB06_1.4	
<b>Fill</b> Gravelly clay, brown, moist, soft, angular shale, siltstone and sandstone gravels <30mm (50%), clay is plastic.			2							
<b>Fill</b> Gravel, black, slightly moist, angular coal gravel <30mm, homogenous, no odour or evidence of contamination.			3					0.1		End of hole at 3.0 m bgl, target depth achieved.
End of Log			4							
			5							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MI\_SB07**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>8/10/2013</b>	Total Depth (m): <b>0.8</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>8/10/2013</b>	Hole Diam. / Width (mm): <b>300</b>	Elevation (Ground): -
Drill Co: <b>Numac</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Scott Jessup</b>	Casing Diam. (mm): -	Easting (MGA): <b>224312</b>
Drill Method: <b>NDD</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6305093</b>
Hole Type: <b>Soil Bore</b>	Water Strike (m bgl): -	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Sandy silt with angular gravels and cobbles, grey-brown, dry, poorly sorted, medium plasticity, no staining, no odour.					DS	Y			MI_SB07_0.2	End of hole at 0.8 m bgl, refusal on rocky coal.
End of Log			1							
			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MI\_SB08**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>8/10/2013</b>	Total Depth (m): <b>0.6</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>8/10/2013</b>	Hole Diam. / Width (mm): <b>200</b>	Elevation (Ground): -
Drill Co: <b>Numac</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Scott Jessup</b>	Casing Diam. (mm): -	Easting (MGA): <b>224371</b>
Drill Method: <b>NDD</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6305053</b>
Hole Type: <b>Soil Bore</b>	Water Strike (m bgl): -	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Coarse gravels with clay and some cobbles, light grey-brown, dry, angular gravels and cobbles, poorly sorted, no staining, no odour.										End of hole at 0.6 m bgl, NDD refusal on cobbles.
End of Log			1							
			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB01**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>8/11/2013</b>	Total Depth (m): <b>0.25</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>8/11/2013</b>	Hole Diam. / Width (mm): <b>300</b>	Elevation (Ground): -
Drill Co: <b>Cardno</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Simon King</b>	Casing Diam. (mm): -	Easting (MGA): <b>223571</b>
Drill Method: <b>NDD</b>	Surface Completion: <b>Topsoil</b>	Northing (MGA): <b>6305124</b>
Hole Type: <b>Soil Bore</b>	Water Strike (m bgl): -	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Topsoil</b> Clay with some gravels, brown, dry, gravels angular course <40mm, no staining, organic matter (roots and rootlets).	~		0		DS	Y	0.6	MK_SB01_0.2		End of hole at 0.25 m bgl, NDD refusal on cobbles.
End of Log			1							
			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB02**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **28/10/2013** Total Depth (m): **2.35** Final Water Level (m bgl): -  
 Drill Finish Date: **31/10/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Rohan Harding** Casing Diam. (mm): - Easting (MGA): **223521**  
 Drill Method: **NDD/PT** Surface Completion: **Backfill** Northing (MGA): **6304844**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

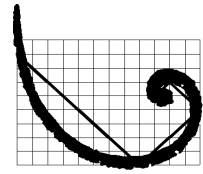
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Topsoil</b> Sandy silt, brown, dry, medium stiff, non plastic, homogenous, no evidence of impact.  <b>Fill</b> Gravel and Sandy clay (intermixed), brown-orange with some grey, mist, soft, medium plasticity, clay increasing with depth. Sandstone, shale, siltstone and coal fine gravel to cobbles throughout, poorly sorted, sub angular, no evidence of impact.			0					0.3		
			0.5		DS	Y		1.1	MK_SB02_0.5	
			1					0.4		
			1.5		DS	Y		1.6	MK_SB02_1.5	
<b>Sandstone</b> Weathered, grey, moist, becoming orange and wet between 1.75-1.85m, fine-medium coarse, well sorted, no evidence of impact.			2					1.1		
			2.35					1.2		End of hole at 3.0 m bgl, PT refusal on sandstone.
End of Log			3							
			4							
			5							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB03**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **8/11/2013** Total Depth (m): **1.1** Final Water Level (m bgl): -  
 Drill Finish Date: **8/11/2013** Hole Diam. / Width (mm): **300** Elevation (Ground): -  
 Drill Co: **Cardno** Casing Type: **None** Elevation (Case): -  
 Driller: **Simon King** Casing Diam. (mm): - Easting (MGA): **223576**  
 Drill Method: **NDD** Surface Completion: **Topsoil** Northing (MGA): **6305058**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Topsoil</b> Clay, brown, dry, fine grained, homogenous, no staining, organic matter (roots and rootlets).			0					0.3		
<b>Fill</b> Gravelly clay, brown, dry, coarse, angular gravels <40 mm (20%), no staining, no odour.			0.3		DS	Y		0.6	MK_SB03_0.5	
<b>Fill</b> Sand with some gravels, fine to medium grained, poorly sorted, angular, sandstone gravels <75mm, no staining.			1					0.4		End of hole at 1.1 m bgl, NDD refusal on cobbles.
<b>Fill</b> Gravelly clay with some sand, brown, coarse, angular gravels 5-75mm (50%), no staining, cobbles encountered at 1 m.										
End of Log			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Page 1 of 1

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB04**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **28/10/2013** Total Depth (m): **3.0** Final Water Level (m bgl): -  
 Drill Finish Date: **31/10/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Rohan Harding** Casing Diam. (mm): - Easting (MGA): **223571**  
 Drill Method: **NDD/PT** Surface Completion: **Gatic** Northing (MGA): **6304963**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Topsoil</b> Sandy silt, brown, dry, medium stiff, non plastic, homogenous, no evidence of impact.			0.6		DS	Y		0.6	MK_SB04_0.2	
<b>Fill</b> Gravel and Sandy clay (intermixed), brown-orange with some grey, mist, soft, medium plasticity, clay increasing with depth. Sandstone, shale, siltstone and coal fine gravel to cobbles throughout, poorly sorted, sub angular, no evidence of impact.			1.0					0.5		
<b>Fill</b> Clayey sand, brown, moist, medium dense, fine to coarse sands, moderately sorted with fine gravel and cobbles, sub rounded, no evidence of impact.			2.0					0.3		
<b>Clayey Sand</b> Clayey sand, brown, becoming grey from 2.6m, moist, soft, fine-medium grained, well sorted, no evidence of impact.			2.8		US	Y		0.4	MK_SB04_2.8	End of hole at 3.0 m bgl, target depth achieved.
<b>Sandstone</b> Weathered, grey, fine grained.			3.0					1		
End of Log			4.0							
			5.0							
			6.0							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB05**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **28/10/2013** Total Depth (m): **1.15** Final Water Level (m bgl): -  
 Drill Finish Date: **28/10/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): -  
 Drill Co: **Cardno** Casing Type: **None** Elevation (Case): -  
 Driller: **Nathan Kelleher** Casing Diam. (mm): - Easting (MGA): **223547**  
 Drill Method: **NDD** Surface Completion: **Gatic** Northing (MGA): **6304931**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Topsoil</b> Sandy silt, brown, dry, medium stiff, non plastic homogenous, no evidence of impact.			0.2					0.2		
<b>Fill</b> Silty, gravel with trace clay, moist, dense, fine sand to cobbles, poorly sorted, no evidence of impact.			0.5		DS	Y		0.5	T01_281013_01_GP	
			1					0.1		End of hole at 1.15 m bgl, tNDD refusal on cobbles.
End of Log			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB06**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **28/10/2013** Total Depth (m): **0.55** Final Water Level (m bgl): -  
 Drill Finish Date: **28/10/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): -  
 Drill Co: **Cardno** Casing Type: **None** Elevation (Case): -  
 Driller: **Nathan Kelleher** Casing Diam. (mm): - Easting (MGA): **223559**  
 Drill Method: **NDD** Surface Completion: **Backfill** Northing (MGA): **6304895**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Topsoil</b> Sandy silt, brown, dry, medium stiff, non plastic, homogenous, no evidence of impact. <b>Fill</b> Gravel and sandy clay, brown-orange with some grey, moist, soft, medium plasticity, clay increasing with depth. fine gravel to cobbles comprising coal, sandstone and siltstone, poorly sorted, sub angular, no evidence of impact. Refusal on siltstone.			0		DS	Y		0.1	MK_SB06_0.2	End of hole at 3.0 m bgl, NDD refusal on siltstone.
End of Log			1					0		
			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**

Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB07**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>28/10/2013</b>	Total Depth (m): <b>1.6</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>31/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): -
Drill Co: <b>Numac</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): -	Easting (MGA): <b>223557</b>
Drill Method: <b>NDD/PT</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6304832</b>
Hole Type: <b>Soil Bore</b>	Water Strike (m bgl): -	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Topsoil</b> Sandy silt, brown, dry, medium stiff, non plastic, homogenous, no evidence of impact.  <b>Fill</b> Silty sand with gravel, brown, moist, medium dense, fine sand to cobbles, sub rounded, no evidence of impact, trace clay from 0.8m.			0.2 0.3 0.6					0.2 0.3 0.6		
<b>Coal</b>								0		End of hole at 1.6 m bgl, PT refusal on coal.
End of Log			2 3 4 5 6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MK\_SB08**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>8/11/2013</b>	Total Depth (m): <b>0.9</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>8/11/2013</b>	Hole Diam. / Width (mm): <b>300</b>	Elevation (Ground): -
Drill Co: <b>Cardno</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Simon King</b>	Casing Diam. (mm): -	Easting (MGA): <b>223573</b>
Drill Method: <b>NDD</b>	Surface Completion: <b>Topsoil</b>	Northing (MGA): <b>6305118</b>
Hole Type: <b>Soil Bore</b>	Water Strike (m bgl): -	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Topsoil</b> Clay with some rare gravels <50mm, brown, dry, homogenous, no staining, organic matter (roots).					DS	Y		0.9	MK_SB08_0.2	
<b>Fill</b> Gravelly clay, brown with coarse gravels and cobbles <300mm, poorly sorted, no staining, organic matter at 0.8m.								0.8		End of hole at 0.9 m bgl, NDD refusal on cobbles.
End of Log			1							
			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB09**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **10/10/2013** Total Depth (m): **1.25** Final Water Level (m bgl): -  
 Drill Finish Date: **31/10/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Rohan Harding** Casing Diam. (mm): - Easting (MGA): **223601**  
 Drill Method: **NDD/PT** Surface Completion: **Backfill** Northing (MGA): **6305076**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Topsoil</b> Sandy silt, brown, dry, medium stiff, non plastic, grass roots throughout, no evidence of impact.			0		DS	Y		0.2	MK_SB09_0.1	
<b>Fill</b> Sandy gravel, pale brown with dark grey and orange inclusions, dense, fine sands to cobbles consisting of siltstone and sandstone and coal fragments, poorly sorted, sub rounded gravels, no evidence of impact.			0.5					0		
			1		DS	Y		0.1	MK_SB09_1.15	End of hole at 1.25 m bgl, PT refusal on coal.
<b>Coal</b>										
End of Log			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB10**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **10/10/2013** Total Depth (m): **1.8** Final Water Level (m bgl): -  
 Drill Finish Date: **14/10/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Jared Mudie** Casing Diam. (mm): - Easting (MGA): **223595**  
 Drill Method: **NDD/PT** Surface Completion: **Backfill** Northing (MGA): **6305043**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Topsoil</b> Sandy silt, brown, dry, medium stiff, non plastic, grass roots throughout, no evidence of impact			0		DS	Y		0.3	MK_SB10_0.1	End of hole at 1.8 m bgl, PT refusal.
<b>Fill</b> Sandy gravel, pale brown with dark grey and orange inclusions, moist, dense, fine sands to cobbles, poorly sorted, sub rounded gravels, heterogeneous with siltstone, sandstone and coal fragments, no evidence of impact.			1		DS	Y		0	T_111013_01_GP	
<b>Fill</b> Clayey gravelly sand, dark brown, moist, medium dense, fine sands to pebble gravels, poorly sorted, sub angular to rounded grains, clay increasing with depth, no evidence of impact.			1.5		DS	Y			MK_SB10_1.5	
<b>Sandy clay</b> With gravels, brown with grey mottles and black inclusions from 1.6m, moist, soft, low plasticity, heterogeneous with shale and coal gravel inclusions, no evidence of impact.			1.8					0.2		
End of Log			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB11**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **28/10/2013** Total Depth (m): **1.7** Final Water Level (m bgl): -  
 Drill Finish Date: **30/10/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Rohan Harding** Casing Diam. (mm): - Easting (MGA): **223621**  
 Drill Method: **NDD/PT** Surface Completion: **Backfill** Northing (MGA): **6304959**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Topsoil</b> Sandy silt, brown, dry, medium stiff, non plastic, homogenous, no evidence of impact.  <b>Fill</b> Gravel and Sandy clay (intermixed), brown-orange with some grey, mist, soft, medium plasticity, clay increasing with depth. Sandstone, shale, siltstone and coal fine gravel to cobbles throughout, poorly sorted, sub angular, no evidence of impact.			0					0		
			0.1							
			1	<input checked="" type="checkbox"/>	DS	Y		0.3	MK_SB11_1.0	
<b>Coal</b>								0.5		End of hole at 1.7 m bgl, PT refusal on coal.
End of Log			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB12**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **17/10/2013** Total Depth (m): **0.45** Final Water Level (m bgl): -  
 Drill Finish Date: **17/10/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Scott Jessup** Casing Diam. (mm): - Easting (MGA): **223168**  
 Drill Method: **NDD** Surface Completion: **Backfill** Northing (MGA): **6305269**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Gravelly Sand</b> Pale brown, dry, dense, fine sands with minor coarse gravel, no evidence of impact.					DS	Y		0.3	MK_SB12_0.2	End of hole at 0.45 m bgl, NDD refusal on apparent bedrock.
<b>Fill</b> Gravel and Sandy clay (intermixed), brown-orange with some grey, mist, soft, medium plasticity, clay increasing with depth. Sandstone, shale, siltstone and coal fine gravel to cobbles throughout, poorly sorted, sub angular, no evidence of impact.			1							
End of Log			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MK\_SB13**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **17/10/2013** Total Depth (m): **1.6** Final Water Level (m bgl): -  
 Drill Finish Date: **8/11/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Cale Manger** Casing Diam. (mm): - Easting (MGA): **223652**  
 Drill Method: **NDD/PT** Surface Completion: **Backfill** Northing (MGA): **6305237**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks	
Ground Surface			0								
<b>Fill</b> Pale brown, dry, dense, fine sands with minor coarse gravel, no evidence of impact.  <b>Fill</b> Gravel and sandy clay (intermixed), brown-orange with some grey, moist, soft, medium plasticity, clay increasing with depth, fine gravel to cobbles comprising sandstone, shale, siltstone and coal, poorly sorted, sub angular, no evidence of impact.								0.3			
								0.5	MK_SB13_0.5		
									1.1	MK_SB13_1.0	
									0.4	MK_SB13_1.6	
<b>Sandstone Refusal</b>  End of Log			2							End of hole at 1.6 m bgl, PT refusal on sandstone.	
			3								
			4								
			5								
			6								

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB14**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **10/10/2013** Total Depth (m): **3.0** Final Water Level (m bgl): -  
 Drill Finish Date: **16/10/2013** Hole Diam. / Width (mm): **150** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Rohan Harding** Casing Diam. (mm): - Easting (MGA): **223654**  
 Drill Method: **NDD/PT/SFA** Surface Completion: **Backfill** Northing (MGA): **6305180**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

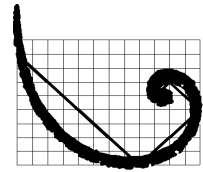
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Topsoil</b> Sandy silt, brown, dry, medium stiff, non plastic, grass roots throughout, no evidence of impact.  <b>Fill</b> Gravel and Sandy clay (intermixed), brown-orange with some grey, mist, soft, medium plasticity, clay increasing with depth. Sandstone, shale, siltstone and coal fine gravel to cobbles throughout, poorly sorted, sub angular, no evidence of impact.			0		DS	Y		0.4	MK_SB14_0.1	
			0.3							
			1		DS	Y		0.1	MK_SB14_1.0	
<b>Sandstone</b> Highly weathered, grey-orange brown, medium dense, inclusions of coal from 1.85m, no evidence of impact			2					0		
<b>Sandstone</b> Grey, moist, dense, fine grained, well sorted, rounded, no evidence of impact			3					0		
			3					0.3		End of hole at 3.0 m bgl, target depth achieved.
End of Log			4							
			5							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB15**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **10/10/2013** Total Depth (m): **1.2** Final Water Level (m bgl): -  
 Drill Finish Date: **30/10/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Rohan Harding** Casing Diam. (mm): - Easting (MGA): **223657**  
 Drill Method: **NDD/PT** Surface Completion: **Backfill** Northing (MGA): **6304948**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Topsoil</b> Sandy silt, brown, dry, medium stiff, non plastic, grass roots throughout, no evidence of impact.			0		DS	Y		0.4	MK_SB15_0.1	
<b>Fill</b> Gravelly sandy clay, dark grey, moist, soft, medium plasticity, intermixed with fine sands to pebble gravels and cobbles, sub angular, poorly sorted, no evidence of impact, major sandstone, minor coal inclusions.			1					0.3		
<b>Coal</b>			1.2					0.1 0.1		End of hole at 1.2 m bgl, PT refusal on coal.
End of Log			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB16 / MK\_MW01**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **10/10/2013** Total Depth (m): **8.7** Final Water Level (m bgl): **3.205**  
 Drill Finish Date: **14/10/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): **940.399**  
 Drill Co: **Numac** Casing Type: **PVC** Elevation (Case): **940.335**  
 Driller: **Jared Mudie** Casing Diam. (mm): **50** Easting (MGA): **223647.956**  
 Drill Method: **NDD/PT/AH** Surface Completion: **Backfill** Northing (MGA): **6305089.593**  
 Hole Type: **Monitoring Well** Water Strike (m bgl): **-**

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Topsoil</b> Sandy silt, brown, dry, medium stiff, non plastic, grass roots throughout, no evidence of impact.			0					0.2		
<b>Fill</b> Clayey gravelly sand, dark brown, damp, medium dense, fine sands - pebbles, poorly sorted, sub angular to rounded grains, clay increasing with depth, sandstone, coal and shale cobble inclusions from 1.4m, no evidence of impact			0.5		DS	Y		0.5	MK_SB16_0.5	
			1					0.3		
			1.5		DS	Y		0.1	MK_SB16_1.5	
<b>Coal</b> Black, dry, hard.			2							
<b>Siltstone</b> Pale grey, dry, fine grained, hard.			3							
			4							
<b>Sandstone</b> Pale grey, grey from 6m, dry, moisture increasing from 4.8m, medium coarse grained, grain size increasing with depth, hard.			4							
			5					0		
			6					0		

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB16 / MK\_MW01**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>10/10/2013</b>	Total Depth (m): <b>8.7</b>	Final Water Level (m bgl): <b>3.205</b>
Drill Finish Date: <b>14/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>940.399</b>
Drill Co: <b>Numac</b>	Casing Type: <b>PVC</b>	Elevation (Case): <b>940.335</b>
Driller: <b>Jared Mudie</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223647.956</b>
Drill Method: <b>NDD/PT/AH</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6305089.593</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>-</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			7 8							End of hole at 8.7 m bgl, target depth achieved.
End of Log			9 10 11 12							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**  
 Page 2 of 2

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB17**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **18/10/2013** Total Depth (m): **1.7** Final Water Level (m bgl): -  
 Drill Finish Date: **31/10/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Rohan Harding** Casing Diam. (mm): - Easting (MGA): **223639**  
 Drill Method: **NDD/PT** Surface Completion: **Backfill** Northing (MGA): **6305025**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Topsoil</b> Sandy silt, brown, dry, medium stiff, non plastic, grass roots throughout, no evidence of impact			0					0.1		
<b>Fill</b> Gravel and Sandy clay (intermixed), brown-orange with some grey, mist, soft, medium plasticity, clay increasing with depth. Sandstone, shale, siltstone and coal fine gravel to cobbles throughout, poorly sorted, sub angular, no evidence of impact.			0.3		DS	Y		0.3	MK_SB17_0.5	
			1					0.1		
<b>Coal</b>			1.7		DS	Y		0.1	MK_SB17_1.5	End of hole at 1.7 m bgl, PT refusal on coal.
End of Log			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB18**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **18/10/2013** Total Depth (m): **0.5** Final Water Level (m bgl): -  
 Drill Finish Date: **18/10/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Scott Jessup** Casing Diam. (mm): - Easting (MGA): **223712**  
 Drill Method: **NDD** Surface Completion: **Backfill** Northing (MGA): **6305427**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Sandstone</b> Extremely weathered (sand), brown, moist, very dense, fine to coarse grains, well sorted, sub rounded-rounded, no evidence of impact. Refusal on consolidated sandstone.			0		DS	Y		0.1	MK_SB18_0.1	End of hole at 0.5 m bgl, NDD refusal on weathered sandstone.
End of Log			1							
			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MK\_SB19**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>18/10/2013</b>	Total Depth (m): <b>0.7</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>18/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): -
Drill Co: <b>Numac</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Scott Jessup</b>	Casing Diam. (mm): -	Easting (MGA): <b>223704</b>
Drill Method: <b>NDD</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6305393</b>
Hole Type: <b>Soil Bore</b>	Water Strike (m bgl): -	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Sandstone</b> Extremely weathered (sand), brown, moist, very dense, fine to coarse grains, well sorted, sub rounded-rounded, no evidence of impact.					DS	Y		0	MK_SB19_0.1	
<b>Sandstone</b>								0		End of hole at 0.7 m bgl, NDD refusal on sandstone.
End of Log			1 2 3 4 5 6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB20**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>18/10/2013</b>	Total Depth (m): <b>0.4</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>18/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): -
Drill Co: <b>Numac</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Scott Jessup</b>	Casing Diam. (mm): -	Easting (MGA): <b>223681</b>
Drill Method: <b>NDD</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6305342</b>
Hole Type: <b>Soil Bore</b>	Water Strike (m bgl): -	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Gravelly Sand</b> Brown, dry, dense, fine sands to fine gravel, moderately sorted, sub rounded, no evidence of impact.			0		DS	Y		0	MK_SB20_0.1	End of hole at 0.4 m bgl, NDD refusal on sandstone.
<b>Sandstone</b> Extremely weathered (sand), brown, moist, very dense, fine to coarse grains, well sorted, sub rounded-rounded, no evidence of impact. Refusal on consolidated sandstone. Refusal on consolidated sandstone.			1							
End of Log			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**

Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB22 / MK\_MW07**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **17/10/2013** Total Depth (m): **7.0** Final Water Level (m bgl): **3.359**  
 Drill Finish Date: **6/11/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): **939.452**  
 Drill Co: **Numac** Casing Type: **uPVC** Elevation (Case): **940.281**  
 Driller: **Jared Mudie** Casing Diam. (mm): **50** Easting (MGA): **223717.658**  
 Drill Method: **NDD/PT/SFA/AH** Surface Completion: **Monument** Northing (MGA): **6305241.385**  
 Hole Type: **Monitoring Well** Water Strike (m bgl): **4.8**

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Gravelly Sand</b> Gravelly sand, pale brown, dry, dense, fine sand with coarse gravel, poorly sorted, no evidence of impact.			0					0.1		
<b>Fill</b> Gravel and Sandy clay (intermixed), brown-orange with some grey, mist, soft, medium plasticity, clay increasing with depth. Sandstone, shale, siltstone and coal fine gravel to cobbles throughout, poorly sorted, sub angular, no evidence of impact.			0.8		DS	Y		0.8	MK_SB22_0.5	
			1					2.7		
<b>Siltstone</b> Grey, dry, hard, very fine grained, no evidence of impact.			1.5		DS	Y		3.5	MK_SB22_1.5	
			2							
			3							
			4							
<b>Sandstone</b> Grey, moist, hard, fine to coarse grained, no evidence of impact.			4.8							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MK\_SB22 / MK\_MW07**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>17/10/2013</b>	Total Depth (m): <b>7.0</b>	Final Water Level (m bgl): <b>3.359</b>
Drill Finish Date: <b>6/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>939.452</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>940.281</b>
Driller: <b>Jared Mudie</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223717.658</b>
Drill Method: <b>NDD/PT/SFA/AH</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6305241.385</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>4.8</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			7							End of hole at 7.0 m bgl, target depth achieved.
End of Log			8							
			9							
			10							
			11							
			12							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**  
 Page 2 of 2

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB24**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **12/11/2013** Total Depth (m): **3.0** Final Water Level (m bgl): -  
 Drill Finish Date: **20/11/2013** Hole Diam. / Width (mm): **240** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Jared Mudie** Casing Diam. (mm): - Easting (MGA): **223713**  
 Drill Method: **NDD/PT** Surface Completion: **Concrete** Northing (MGA): **6305123**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Concrete</b> Good condition, no surface staining.								0.7		
<b>Fill</b> Sandy clay with some gravel, brown, clay has medium plasticity, coarse angular gravels <30mm, poorly sorted, no staining, some coal gravels.					DS	Y		0.2	MK_SB24_0.4	
<b>Fill</b> Clayey sand, brown, rounded to angular, medium to coarse grained sands, poorly sorted, some sandstone and coal gravels, non-plastic, no staining. Some cobbles increasing with depth.			1					0.3		
<b>Fill</b> Clay with some gravel and cobbles, orange-brown, mottled red to dark brown and grey with depth, becoming dark grey and wet from 2m, medium stiff, soft (1.8 - 1.9m), fine angular gravels <10mm (20%), high plasticity, organic matter, no staining, no odour.			2		US	Y		1.7	MK_SB24_2.0	
<b>Clay</b> Yellow brown, moist, high plasticity, homogenous, soft, no staining, no odour. Becoming dark brown-black and red, medium stiff at 2.9m.			3					0.4		End of hole at 3.0 m bgl, target depth achieved.
End of Log										
			4							
			5							
			6							

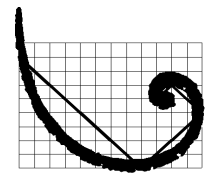
**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB25 / MK\_MW10**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **18/10/2013** Total Depth (m): **22.4** Final Water Level (m bgl): **3.125**  
 Drill Finish Date: **7/11/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): **937.363**  
 Drill Co: **Numac** Casing Type: **uPVC** Elevation (Case): **938.011**  
 Driller: **Jordan Zohs** Casing Diam. (mm): **50** Easting (MGA): **223757.173**  
 Drill Method: **NDD/AH** Surface Completion: **Backfill** Northing (MGA): **6305390.506**  
 Hole Type: **Monitoring Well** Water Strike (m bgl): **-**

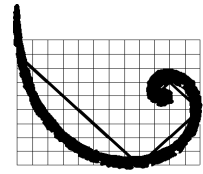
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks	
Ground Surface			0								
<b>Gravelly Sand</b> Gravelly sand, dark brown, dry, dense, fine sand-coarse gravel, poorly sorted, sub rounded gravels, no evidence of impact  <b>Fill</b> Gravel and Sandy clay (intermixed), brown-orange with some grey, mist, soft, medium plasticity, clay increasing with depth. Sandstone, shale, siltstone and coal fine gravel to cobbles throughout, poorly sorted, sub angular, no evidence of impact.			0								
			0.1		DS	Y			MK_SB25_0.2		
			0.1								
<b>Siltstone</b> Grey with red-brown laminations, dry.			1					0			
			2								
			3								
			4								
			5								
			6								

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB25 / MK\_MW10**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>18/10/2013</b>	Total Depth (m): <b>22.4</b>	Final Water Level (m bgl): <b>3.125</b>
Drill Finish Date: <b>7/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>937.363</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>938.011</b>
Driller: <b>Jordan Zohs</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223757.173</b>
Drill Method: <b>NDD/AH</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6305390.506</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>-</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			7							
			8							
			9							
			10							
			11							
			12							

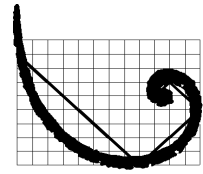
**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB25 / MK\_MW10**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>18/10/2013</b>	Total Depth (m): <b>22.4</b>	Final Water Level (m bgl): <b>3.125</b>
Drill Finish Date: <b>7/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>937.363</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>938.011</b>
Driller: <b>Jordan Zohs</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223757.173</b>
Drill Method: <b>NDD/AH</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6305390.506</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>-</b>	

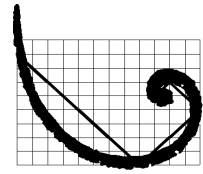
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			13							
			14							
			15							
			16							
			17							
			18							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MK\_SB25 / MK\_MW10**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>18/10/2013</b>	Total Depth (m): <b>22.4</b>	Final Water Level (m bgl): <b>3.125</b>
Drill Finish Date: <b>7/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>937.363</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>938.011</b>
Driller: <b>Jordan Zohs</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223757.173</b>
Drill Method: <b>NDD/AH</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6305390.506</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>-</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			19 20 21 22							End of hole at 22.4 m bgl, target depth achieved.
End of Log			23 24							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**  
 Page 4 of 4

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MK\_SB26**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **18/10/2013** Total Depth (m): **0.4** Final Water Level (m bgl): -  
 Drill Finish Date: **18/10/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Scott Jessup** Casing Diam. (mm): - Easting (MGA): **223749**  
 Drill Method: **NDD** Surface Completion: **Backfill** Northing (MGA): **6305328**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

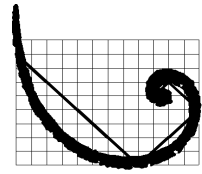
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Gravelly Sand</b> Brown, dry, dense, fine sand-fine gravel, moderately sorted, sub rounded, no evidence of impact					DS	Y			MK_SB26_0.2	End of hole at 0.4 m bgl, NDD refusal on sandstone.
<b>Fill</b> Gravel and Sandy clay (intermixed), brown-orange with some grey, mist, soft, medium plasticity, clay increasing with depth. Sandstone, shale, siltstone and coal fine gravel to cobbles throughout, poorly sorted, sub angular, no evidence of impact.			1							
<b>Sandstone</b> End of Log			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB27**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **17/10/2013** Total Depth (m): **0.55** Final Water Level (m bgl): -  
 Drill Finish Date: **17/10/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Scott Jessup** Casing Diam. (mm): - Easting (MGA): **223752**  
 Drill Method: **NDD** Surface Completion: **Backfill** Northing (MGA): **6305290**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Gravelly Sand</b> Gravelly sand, light brown, dry, dense, fine sands with minor coarse gravel, no evidence of impact <b>Fill</b> Gravel and Sandy clay (intermixed), brown-orange with some grey, mist, soft, medium plasticity, clay increasing with depth. Sandstone, shale, siltstone and coal fine gravel to cobbles throughout, poorly sorted, sub angular, no evidence of impact. <b>Siltstone</b> End of Log			0		DS	Y	1.9	MK_SB27_0.2	End of hole at 0.55 m bgl, NDD refusal on siltstone.	
			1							
			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB28**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **17/10/2013** Total Depth (m): **3.0** Final Water Level (m bgl): -  
 Drill Finish Date: **6/11/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Jared Mudie** Casing Diam. (mm): - Easting (MGA): **223760**  
 Drill Method: **NDD/PT** Surface Completion: **Backfill** Northing (MGA): **6305225**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Gravelly Sand</b> Pale brown, dry, dense, fine sand with minor coarse gravel, moderately sorted, no evidence of impact			0		DS	Y		0.1	MK_SB28_0.2	
<b>Fill</b> Gravel and Sandy clay (intermixed), brown-orange with some grey, mist, soft, medium plasticity, clay increasing with depth. Sandstone, shale, siltstone and coal fine gravel to cobbles throughout, poorly sorted, sub angular, no evidence of impact.			1					0		
								2.6		
<b>Silty Sand</b> Brown, moist, dense, fine sand, well sorted, no evidence of impact.			2		US	Y		2.6	MK_SB28_2.0	
<b>Silty Clay</b> Grey, moist, stiff, high plasticity, homogenous, no evidence of impact.			3					1.3		End of hole at 3.0 m bgl, target depth achieved.
<b>Siltstone</b> End of Log			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB30**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **12/11/2013** Total Depth (m): **3.0** Final Water Level (m bgl): -  
 Drill Finish Date: **20/11/2013** Hole Diam. / Width (mm): **200** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Jared Mudie** Casing Diam. (mm): - Easting (MGA): **223752**  
 Drill Method: **NDD/PT** Surface Completion: **Concrete** Northing (MGA): **6305113**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

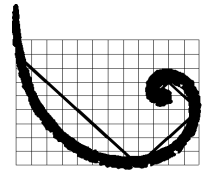
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Concoû-</b>								0.2		
<b>Fill</b> Clay with rare gravels (5%), orange with brown and red mottles, medium stiff, high plasticity, angular gravels <50mm, organic matter (wood fibres), no staining, tree branch at 0.44m.					DS	Y		0.2	MK_SB30_0.5	
<b>Fill</b> Sandy clay with gravel, brown, angular coarse gravels <70mm, some cobbles increasing number with depth, poorly sorted, no staining.			1					0.1		
<b>Fill</b> Gravelly clay, brown with orange, red and grey mottling, angular gravels (60%) of shale, coal, sandstone and siltstone, poorly sorted, stiff with sections of soft sandy clay, organic matter (rootlets), no evidence of contamination .			2					0.4		
<b>Clay</b> With some gravel, yellow-brown and grey, moist, soft, high plasticity, mottled, no evidence of contamination. Sandstone cobble at 2.8m.					US	Y		0.5	MK_SB30_2.7	
<b>Coal</b> Black, wet.			3							End of hole at 3.0 m bgl, target depth achieved.
End of Log										
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB31**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>15/10/2013</b>	Total Depth (m): <b>0.2</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>15/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): -
Drill Co: <b>Numac</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Scott Jessup</b>	Casing Diam. (mm): -	Easting (MGA): <b>223796</b>
Drill Method: <b>NDD</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6305387</b>
Hole Type: <b>Soil Bore</b>	Water Strike (m bgl): -	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Clayey sand, brown, moist, medium dense, fine to medium grained, moderately sorted with minor fine-coarse gravels, no evidence of impact. <b>Sandstone</b> End of Log			0		DS	Y	0.3	MK-SB31-0.2		End of hole at 0.2 m bgl, NDD refusal on sandstone.
			1							
			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB32**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>15/10/2013</b>	Total Depth (m): <b>0.3</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>15/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): -
Drill Co: <b>Numac</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Scott Jessup</b>	Casing Diam. (mm): -	Easting (MGA): <b>223799</b>
Drill Method: <b>NDD</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6305341</b>
Hole Type: <b>Soil Bore</b>	Water Strike (m bgl): -	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Clayey sand, brown, moist, medium dense, fine to medium grained, moderately sorted with minor fine to coarse gravels, no evidence of impact.					DS	Y		0.3	MK-SB32-0.1	End of hole at 0.3 m bgl, NDD refusal on shale.
<b>Shale</b> End of Log			1							
			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB33**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **17/10/2013** Total Depth (m): **1.8** Final Water Level (m bgl): -  
 Drill Finish Date: **6/11/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Jared Mudie** Casing Diam. (mm): - Easting (MGA): **223824**  
 Drill Method: **NDD/PT** Surface Completion: **Backfill** Northing (MGA): **6305291**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Gravelly sand</b> Pale brown, dry, dense, fine sands-coarse gravel, no evidence of impact.								1.9		
<b>Fill</b> Gravel and Sandy clay (intermixed), brown-orange with some grey, mist, soft, medium plasticity, clay increasing with depth. Sandstone, shale, siltstone and coal fine gravel to cobbles throughout, poorly sorted, sub angular, no evidence of impact.					DS	Y		1.8	MK_SB33_0.5	
<b>Sandy clay</b> Orange brown with grey mottles, moist, medium stiff, low plasticity, homogenous, no staining, no odour.								2.4	MK_SB33_1.0	
<b>Clay</b> Grey with dark brown and minor orange mottles, moist, soft, low plasticity, homogenous, no staining, no odour.					DS	Y		2	MK_SB33_1.5	
<b>Clay</b> Grey, damp, stiff, medium plasticity, homogenous, no staining, no odour.								0.7		End of hole at 1.8 m bgl, PT refusal on siltstone.
<b>Siltstone</b>			2							
End of Log			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB34**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **17/10/2013** Total Depth (m): **3.9** Final Water Level (m bgl): -  
 Drill Finish Date: **6/11/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Jared Mudie** Casing Diam. (mm): - Easting (MGA): **223806**  
 Drill Method: **NDD/PT** Surface Completion: **Backfill** Northing (MGA): **6305250**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Gravelly Sand</b> Pale brown, dry, dense, fine sand to coarse gravel, poorly sorted, no evidence of impact.			0.7	■	DS	Y		0.7	MK_SB34_0.2	
<b>Fill</b> Gravel and Sandy clay (intermixed), brown-orange with some grey, mist, soft, medium plasticity, clay increasing with depth. Sandstone, shale, siltstone and coal fine gravel to cobbles throughout, poorly sorted, sub angular, no evidence of impact.			1.1	■	DS	Y		0.4	MK_SB34_0.8	
<b>Sandy clay</b> Orange brown with grey mottles, moist, medium stiff, high plasticity, heterogeneous, no evidence of impact.			2.4					2.4		
<b>Fill</b> Gravel and Sandy clay (intermixed), brown-orange with some grey, mist, soft, medium plasticity, clay increasing with depth. Sandstone, shale, siltstone and coal fine gravel to cobbles throughout, poorly sorted, sub angular, no evidence of impact.			2.8	■	US	Y		2.8	T_061113_01_GP	
<b>Sandy clay</b> With gravel, dark grey, wet, soft, low plasticity, heterogeneous with coal gravel intrusions.			3.0							
<b>Silty Clay</b> Grey with orange mottle, medium stiff, low plasticity, homogenous, no evidence of impact.			3.9					2.4		
			0.9							End of hole at 3.9 m bgl, target depth achieved.
End of Log			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB35**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **17/10/2013** Total Depth (m): **3.9** Final Water Level (m bgl): -  
 Drill Finish Date: **6/11/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Jared Mudie** Casing Diam. (mm): - Easting (MGA): **223794**  
 Drill Method: **NDD/PT** Surface Completion: **Backfill** Northing (MGA): **6305189**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks	
Ground Surface			0								
<b>Gravelly Sand</b> Pale brown, dry, dense, fine sand with minor coarse gravel, moderately sorted, no evidence of impact.  <b>Fill</b> Gravel and sandy clay (intermixed), brown-orange with some grey, mist, soft, medium plasticity, clay increasing with depth. Sandstone, shale, siltstone and coal fine gravel to cobbles throughout, poorly sorted, sub angular, no evidence of impact.			0					0.7			
			0.9		DS	Y		0.9	MK_SB35_1.0		
			0.3						0.3		
			2						0.7		
			3		US	Y		0.9	MK_SB35_3.0		
								0.9		End of hole at 3.9 m bgl, target depth achieved.	
End of Log			4								
			5								
			6								

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB36**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **15/10/2013** Total Depth (m): **0.5** Final Water Level (m bgl): -  
 Drill Finish Date: **15/10/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Scott Jessup** Casing Diam. (mm): - Easting (MGA): **223845**  
 Drill Method: **NDD** Surface Completion: **Backfill** Northing (MGA): **6305377**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Clayey sand, brown, moist, medium dense, fine-medium coarse, moderately sorted with minor fine-coarse gravels, no evidence of impact.					DS	Y		0.5	MK-SB36-0.1	End of hole at 3.0 m bgl, NDD refusal on shale.
								0.7		
End of Log			1							
			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB37**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **15/10/2013** Total Depth (m): **1.45** Final Water Level (m bgl): -  
 Drill Finish Date: **15/10/2013** Hole Diam. / Width (mm): **300** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Scott Jessup** Casing Diam. (mm): - Easting (MGA): **223840**  
 Drill Method: **NDD** Surface Completion: **Backfill** Northing (MGA): **6305332**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks	
Ground Surface			0								
<b>Fill</b> Clayey gravelly sand, dark brown with grey, orange-brown colouration, moist, medium density, fine sand to coarse gravel, moderately sorted, sub-rounded, no evidence of impact.  <b>Sandy clay</b> Orange-brown with grey mottles, medium stiffness, moderate plasticity, homogenous, no evidence of impact.  <b>Sandy clay</b> Grey-orange with brown mottles, stiff, low plasticity, homogenous, no evidence of impact.	  		0.2	■	DS	Y		0.2	MK-SB37-0.3	End of hole at 1.45 m bgl, NDD refusal on sandstone.	
			0.2								
			0.3	■	DS	Y		0.3	MK-SB37-1.0		
<b>Sandstone</b>  End of Log			2								
			3								
			4								
			5								
			6								

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB38**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **15/10/2013** Total Depth (m): **3.9** Final Water Level (m bgl): -  
 Drill Finish Date: **15/10/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Jared Mudie** Casing Diam. (mm): - Easting (MGA): **223862**  
 Drill Method: **NDD/PT** Surface Completion: **Backfill** Northing (MGA): **6305290**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

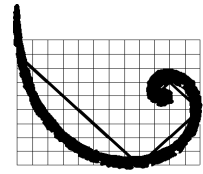
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Sandy gravel (roadbase), dry, very dense, fine sand, pebble inclusions, poorly sorted, sub-rounded, no evidence of impact.			0.1					0.1		
<b>Fill</b> Gravel and sandy clay (intermixed), brown-orange with some grey, mist, soft, medium plasticity, clay increasing with depth. Sandstone, shale, siltstone and coal fine gravel to cobbles throughout, poorly sorted, sub angular, no evidence of impact.			0.1	■	DS	Y		0.1	MK-SB38-0.5	
<b>Fill</b> Gravelly sandy clay, dark brown, moist, medium density, fine sand cobbles, poorly sorted, sub-rounded gravels, no evidence of impact.			2.1					2.1		
<b>Fill</b> Gravel and sandy clay (intermixed), brown-orange with some grey, mist, soft, medium plasticity, clay increasing with depth. Sandstone, shale, siltstone and coal fine gravel to cobbles throughout, poorly sorted, sub angular, no evidence of impact.			3.2					3.2		
<b>Silty Sand</b> Grey, moist, dense, fine grained, well sorted, no evidence of impact.			3.1					3.1		
<b>Sandy clay</b> Pale grey with orange mottles, medium stiffness, moderate plasticity, no evidence of impact.			3.9	■	US	Y		3.9	MK_SB38_3.8	End of hole at 3.9 m bgl, target depth achieved.
End of Log			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB39 / MK\_MW02**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>15/10/2013</b>	Total Depth (m): <b>6.0</b>	Final Water Level (m bgl): <b>2.345</b>
Drill Finish Date: <b>16/10/2013</b>	Hole Diam. / Width (mm): <b>150</b>	Elevation (Ground): <b>939.085</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>939.049</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223867.036</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Gatic</b>	Northing (MGA): <b>6305228.778</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>4.0</b>	

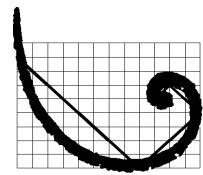
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Sandy gravel (roadbase), dry, very dense, fine sand, pebble inclusions, poorly sorted, sub-rounded, no evidence of impact.			0.1					0.1		
<b>Fill</b> Clayey gravelly sand, light brown, brown with orange brown mottle from 0.8m, moist, medium dense, fine sand to cobbles, poorly sorted, sub rounded gravels, weathered sandstone inclusions from 0.8m, no evidence of impact			1		DS	Y		0.1	MK-SB39-1.0	
<b>Fill</b> Gravelly sandy clay, dark brown, moist, soft, medium plasticity, heterogeneous with coal shale and sandstone coarse gravel to cobble inclusions, no evidence of impact.			0.8					0.8		
			1.2					1.2		
<b>Sandstone</b> Weathered, grey, moist, dense, fine grained, well sorted, no evidence of impact.			3					1.3		
<b>Sandy clay</b> With gravels, dark brown with orange-brown and black mottle, moist, stiff, low plasticity, heterogeneous with sandstone, coal and shale gravels throughout, no evidence of impact.			4					1.7		
<b>Sandy clay</b> Grey with minor orange-brown and black mottle, moist, soft, low plasticity, heterogeneous with fine gravel inclusions, no evidence of impact.			5		DS	Y		2.7	MK-SB39-5.0	
<b>Sandy clay</b> Olive-brown with orange-brown mottle, moist, medium stiff, moderate plasticity, homogenous, no evidence of impact.			6					2.4		End of hole at 6.0 m bgl, target depth achieved.
End of Log										

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB40**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **15/10/2013** Total Depth (m): **3.0** Final Water Level (m bgl): -  
 Drill Finish Date: **15/10/2013** Hole Diam. / Width (mm): **150** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Jared Mudie** Casing Diam. (mm): - Easting (MGA): **223521**  
 Drill Method: **NDD/PT/SFA** Surface Completion: **Backfill** Northing (MGA): **6304844**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks	
Ground Surface			0								
<b>Fill</b> Sandy gravel (roadbase), dry, very dense, fine sand to pebble gravels, poorly sorted, sub-rounded, no evidence of impact.  <b>Fill</b> Gravel and sandy clay (intermixed), brown-orange with some grey, moist, soft, medium plasticity, clay increasing with depth. Sandstone, shale, siltstone and coal fine gravel to cobbles throughout, poorly sorted, sub angular, no evidence of impact.			0					0			
			0.1		DS	Y		0.1	MK-SB40-0.7		
			1						0.1		
			2		US	Y		3	MK_SB40_2.0		
End of Log			3					1.4		End of hole at 3.0 m bgl, target depth achieved.	
			4								
			5								
			6								

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB42**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>11/11/2013</b>	Total Depth (m): <b>6.0</b>	Final Water Level (m bgl): <b>940.040</b>
Drill Finish Date: <b>21/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>939.930</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>940.040</b>
Driller: <b>Jared Mudie</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223840.501</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Gatic</b>	Northing (MGA): <b>6305091.518</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>4.0</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Concrete</b> Good condition, no staining.			0					0.1		
<b>Fill</b> Gravelly clay, dark brown-black, dry, becoming moist between 1.5 - 2.7m, coarse angular gravels <30mm (20%), clay is moderately plastic, no staining, some cobbles increasing with depth, grey sandstone and shale cobbles 1.6-1.8m,			0.4		DS	Y			MK_SB42_0.4	
			0.5							
<b>Sand</b> Grey, moist, medium to coarse grained, angular, poorly sorted, no evidence of contamination.			3							
<b>Clay</b> With rare fine gravels, pale grey mottled orange, becoming grey (2.9m), orange (3.6 - 4m), pale grey-brown (4.3m), yellow brown (4.9m), moist becoming wet at 4m, homogenous, soft becoming stiff, high plasticity, organic matter, faint organic odour.			4		US	Y		0.4	MK_SB42_3.5	
			4							
			5					1.2		
			6							End of hole at 6.0 m bgl, target depth achieved.
End of Log										

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MK\_SB43**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>6/11/2013</b>	Total Depth (m): <b>1.7</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>20/11/2013</b>	Hole Diam. / Width (mm): <b>200</b>	Elevation (Ground): -
Drill Co: <b>Numac</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Jared Mudie</b>	Casing Diam. (mm): -	Easting (MGA): <b>223897</b>
Drill Method: <b>NDD/PT</b>	Surface Completion: <b>Topsoil</b>	Northing (MGA): <b>6304951</b>
Hole Type: <b>Soil Bore</b>	Water Strike (m bgl): -	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Gravelly clay with some sand, brown becoming dark brown at 1.5m, dry, poorly sorted, coarse angular gravels, building rubble and cobbles at 1m, very stiff, organic matter, no staining, no odour.			0	■	DS	Y		0.1	MK_SB43_0.2	
								0.1		
			1					0.1		
<b>Fill</b> Gravel, shale, coal, sandstone and siltstone with shale cobbles, dark brown, rounded, angular, poorly sorted, organic matter, no evidence of contamination.				■	US	Y		1	MK_SB43_1.6	End of hole at 1.7 m bgl, PT refusal on cobbles.
End of Log			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB44**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **6/11/2013** Total Depth (m): **3.0** Final Water Level (m bgl): -  
 Drill Finish Date: **20/11/2013** Hole Diam. / Width (mm): **300** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Jared Mudie** Casing Diam. (mm): - Easting (MGA): **223885**  
 Drill Method: **NDD/PT** Surface Completion: **Topsoil** Northing (MGA): **6304900**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Gravelly clay, brown, becoming dark brown from 1.5m, dry, coarse, angular gravels with some cobbles <250mm (50%), poorly sorted, roots and rootlets, very stiff, low plasticity, organic matter, no staining, no odour.			0		DS	Y		0	MK_SB44_0.2	
			0						0	
			1							
			2							
			2.5		US	Y		2.5	MK_SB44_2.5	
No recovery.			3							End of hole at 3.0 m bgl, target depth achieved.
End of Log			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MK\_SB45**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>27/11/2013</b>	Total Depth (m): <b>0.1</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>27/11/2013</b>	Hole Diam. / Width (mm): <b>150</b>	Elevation (Ground): -
Drill Co: <b>ERM</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Thavone Shaw</b>	Casing Diam. (mm): -	Easting (MGA): <b>223838</b>
Drill Method: <b>HA</b>	Surface Completion: <b>Topsoil</b>	Northing (MGA): <b>6304878</b>
Hole Type: <b>Surface Sample</b>	Water Strike (m bgl): -	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Topsoil</b> Clay, brown, dry, roots and rootlets, medium plasticity, no evidence of impact.			0		DS	Y		0.3	MK_SB45_0.05	
End of Log			1							
			2							
			3							
			4							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB46**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **29/10/2013** Total Depth (m): **2.1** Final Water Level (m bgl): -  
 Drill Finish Date: **31/10/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Rohan Harding** Casing Diam. (mm): - Easting (MGA): **223876**  
 Drill Method: **NDD/PT** Surface Completion: **Backfill** Northing (MGA): **6304806**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

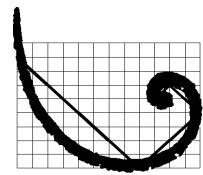
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Silty sand with gravel, brown, dry, dense, fine sands with pebble gravel, poorly sorted, no evidence of impact.  <b>Fill</b> Clayey sand with gravel, brown, moist, medium density, fine sand with cobbles, poorly sorted, coal, siltstone with weathered sandstone inclusions, no evidence of impact.			1		DS	Y		1.7	MK_SB46_1.0	
<b>Sandstone</b> Weathered, interlayered with coal.			2		US	Y		2	MK_SB46_2.0	End of hole at 2.1 m bgl, PT refusal on siltstone.
<b>Siltstone</b>  End of Log			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB47**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **29/10/2013** Total Depth (m): **3.0** Final Water Level (m bgl): -  
 Drill Finish Date: **31/10/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Rohan Harding** Casing Diam. (mm): - Easting (MGA): **223860**  
 Drill Method: **NDD/PT** Surface Completion: **Backfill** Northing (MGA): **6304725**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Topsoil</b> Silty sand, brown, dry, medium density, fine to coarse sands, well sorted, rounded, no evidence of impact.			0							
<b>Fill</b> Clayey sand with gravel, brown, moist, medium density, fine sand with cobbles, poorly sorted, sub-rounded, no evidence of impact.			0.5	■	DS	Y			MK_SB47_0.5	
<b>Sandy Clay</b> Grey with orange mottles, moist, soft, high plasticity, homogenous, no evidence of impact.			1							
<b>Sandy Clay</b> With gravel, orange-brown with grey mottles, stiff, non-plastic, moist, heterogeneous, no evidence of impact.			2					0.7		
<b>Sandy Clay</b> Pale brown with orange mottles, moist, high plasticity, heterogeneous, no evidence of impact.			2.5					1.2		
<b>Clayey Sand</b> With gravel, dark brown, wet, medium density, fine sand to cobbles, poorly sorted, no evidence of impact.			3	■	US	Y		2.2	MK_SB47_3.0	End of hole at 3.0 m bgl, target depth achieved.
End of Log			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB49**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **7/11/2013** Total Depth (m): **1.2** Final Water Level (m bgl): -  
 Drill Finish Date: **7/11/2013** Hole Diam. / Width (mm): **300** Elevation (Ground): -  
 Drill Co: **Cardno** Casing Type: **None** Elevation (Case): -  
 Driller: **Simon King** Casing Diam. (mm): - Easting (MGA): **223795**  
 Drill Method: **NDD** Surface Completion: **Topsoil** Northing (MGA): **6304725**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Topsoil</b> Clay, dark brown, dry, very fine grained, homogenous, no staining, organic matter (roots).								0		
<b>Fill</b> Gravelly clay, dry, brown, poorly sorted, coarse, angular gravels <150 mm (30%), no staining, gravels, cobbles at 0.7 m with some sand at 0.9 m.					DS	Y		0.1	T01_071113_TS	
			1					0.1		End of hole at 1.2 m bgl, NDD refusal on cobbles.
End of Log			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB50**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **14/10/2013** Total Depth (m): **0.45** Final Water Level (m bgl): -  
 Drill Finish Date: **14/10/2013** Hole Diam. / Width (mm): **300** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Scott Jessup** Casing Diam. (mm): - Easting (MGA): **223698**  
 Drill Method: **NDD** Surface Completion: **Backfill** Northing (MGA): **6304697**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Gravelly sandy silt, pale brown, dry, stiff, non-plastic, heterogeneous with fine sand to coarse gravel inclusions, no evidence of impact.			0		DS	Y		0.2	T_141011_01_GP	End of hole at 0.45 m bgl, NDD refusal on shale.
								0.1		
<b>Fill</b> Gravelly sandy clay, dark brown, soft, medium plasticity, heterogeneous, fine sand to coarse gravel inclusions, no evidence of contamination, bedrock encountered at 0.45m.			1							
End of Log			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB51 / MK\_MW05**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>30/10/2013</b>	Total Depth (m): <b>5.0</b>	Final Water Level (m bgl): <b>4.232</b>
Drill Finish Date: <b>1/11/2013</b>	Hole Diam. / Width (mm): <b>200</b>	Elevation (Ground): <b>940.501</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>941.111</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223821.517</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304683.876</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>2.5</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Silty sand with gravel, brown, dry, dense, fine to medium course sand with fine gravel, well sorted, no evidence of impact, large tree root at 0.25m.			0					0.7		
<b>Shale</b> Grey, boulder.			0.4					0.4		
<b>Clayey Gravel</b> Dark brown, moist, medium density, fine to coarse gravel, sub-rounded, no evidence of impact, moderately sorted.			1		DS	Y		1.1	MK_SB51_1.0	
<b>Sandy clay</b> With Gravel, dark brown, moist soft, medium plasticity, heterogeneous with shale and sandstone, fine gravels with cobble inclusions.			1.6					1.1		
<b>Sandstone</b> Grey, moist, medium density, fine to coarse sands, rounded, moderately sorted, no evidence of impact.			2							
			2.5							
			3		US	Y		3.8	MK_SB51_3.0	
			3.8							
<b>Shale</b> Black, interbedded with coal, wet.			4							
			5							End of hole at 5.0 m bgl, target depth achieved
End of Log			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB52**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **14/10/2013** Total Depth (m): **0.5** Final Water Level (m bgl): -  
 Drill Finish Date: **14/10/2013** Hole Diam. / Width (mm): **300** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Scott Jessup** Casing Diam. (mm): - Easting (MGA): **223761**  
 Drill Method: **NDD** Surface Completion: **Backfill** Northing (MGA): **6304697**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Clayey gravelly sand, pale brown, moist, dense, fine sand to cobbles, poorly sorted, sub-angular, sub-rounded, coal, shale, sandstone fragments, no evidence of impact, bedrock encountered at 0.5m.			0		DS	Y		0.1	MK-SB52-0.1	End of hole at 0.5 m bgl, NDD refusal on shale.
End of Log			1							
			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB54**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **11/11/2013** Total Depth (m): **1.1** Final Water Level (m bgl): -  
 Drill Finish Date: **11/11/2013** Hole Diam. / Width (mm): **300** Elevation (Ground): -  
 Drill Co: **Cardno** Casing Type: **None** Elevation (Case): -  
 Driller: **Simon King** Casing Diam. (mm): - Easting (MGA): **223896**  
 Drill Method: **NDD** Surface Completion: **Backfill** Northing (MGA): **6305390**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

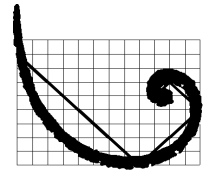
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Asphalt</b>					DS	Y		2.4	MK_SB54_0.15	
<b>Fill</b> Clayey sand (roadbase), orange-brown, moist, dense, fine to coarse sand, moderately sorted, no evidence of impact.								1.2		
<b>Clay</b> Dark brown, moist, soft, high plasticity, homogenous, no evidence of impact.			1		DS	Y		1.4	MK_SB54_1.0	End of hole at 1.1 m bgl, NDD refusal on siltstone.
<b>Silty Clay</b> Grey with orange mottles, moist, soft, high plasticity, homogenous, no evidence of impact, siltstone bedrock encountered at 1.1m.										
End of Log										
			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB55**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **15/10/2013** Total Depth (m): **0.6** Final Water Level (m bgl): -  
 Drill Finish Date: **15/10/2013** Hole Diam. / Width (mm): **300** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Scott Jessup** Casing Diam. (mm): - Easting (MGA): **223905**  
 Drill Method: **NDD** Surface Completion: **Backfill** Northing (MGA): **6305352**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Clayey gravelly sand, dark brown with grey and orange-brown colouration, moist, medium density, fine sand to coarse gravel, moderately sorted, sub-rounded, no evidence of impact.					DS	Y		0.2	MK-SB55-0.2	End of hole at 0.4 m bgl, NDD refusal on shale.
<b>Shale</b> Bedrock										
End of Log			1							
			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB56**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **15/10/2013** Total Depth (m): **0.7** Final Water Level (m bgl): -  
 Drill Finish Date: **15/10/2013** Hole Diam. / Width (mm): **300** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Scott Jessup** Casing Diam. (mm): - Easting (MGA): **223920**  
 Drill Method: **NDD** Surface Completion: **Backfill** Northing (MGA): **6305305**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Clayey gravelly sand, no evidence of impact.					DS	Y		0.2	MK-SB56-0.2	
<b>Fill</b> Gravel and sandy clay (intermixed), brown-orange with some grey, moist, soft, medium plasticity, clay increasing with depth. Sandstone, shale, siltstone and coal fine gravel to cobbles throughout, poorly sorted, sub angular, no evidence of impact.								0.1		End of hole at 0.7 m bgl, NDD refusal on shale.
End of Log			1							
			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB57**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **15/10/2013** Total Depth (m): **3.9** Final Water Level (m bgl): -  
 Drill Finish Date: **7/11/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Jared Mudie** Casing Diam. (mm): - Easting (MGA): **223913**  
 Drill Method: **NDD/PT** Surface Completion: **Backfill** Northing (MGA): **6305245**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks	
Ground Surface			0								
<b>Fill</b> Sandy gravel (roadbase), dry, very dense, fine sand to pebble gravels, poorly sorted, sub-rounded, no evidence of impact.  <b>Fill</b> Gravel and sandy clay (intermixed), brown-orange with some grey, mist, soft, medium plasticity, clay increasing with depth. Sandstone, shale, siltstone and coal fine gravel to cobbles throughout, poorly sorted, sub angular, no evidence of impact.			0								
			1		DS	Y		0	MK-SB57-1.0		
			3.1								
			2						3		
			3		US	Y		2.8	MK_SB57_3.0		
			4								
			5								
			6								
End of Log										End of hole at 3.9 m bgl, target depth achieved.	

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB58**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **29/10/2013** Total Depth (m): **3.9** Final Water Level (m bgl): -  
 Drill Finish Date: **7/11/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Jared Mudie** Casing Diam. (mm): - Easting (MGA): **223897**  
 Drill Method: **NDD/PT** Surface Completion: **Backfill** Northing (MGA): **6305204**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Silty sand with gravel, brown, moist, very dense, fine sand to pebble gravels, sub angular, poorly sorted, no evidence of impact.			0		DS	Y		1.5	MK_SB58_0.1	
<b>Fill</b> Siltstone, grey.							0.3			
<b>Fill</b> Clayey sand with gravel, brown with orange brown mottles, moist, medium density, fine sands to cobbles, poorly sorted, no evidence of impact, clay increasing with depth, siltstone, coal and sandstone cobbles throughout, becoming wet from 1.4 m.							0.5			
							2			
			2		US	Y		3.1	MK_SB58_2.0	
			3							
								2.2		End of hole at 3.9 m bgl, target depth achieved.
End of Log			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB59**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **15/10/2013** Total Depth (m): **0.75** Final Water Level (m bgl): -  
 Drill Finish Date: **15/10/2013** Hole Diam. / Width (mm): **300** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Scott Jessup** Casing Diam. (mm): - Easting (MGA): **223880**  
 Drill Method: **NDD** Surface Completion: **Backfill** Northing (MGA): **6305154**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Sandy gravel (roadbase), dry, very dense, fine sand to pebble gravels, poorly sorted, sub-rounded, no evidence of impact.					DS	Y		0.1	MK-SB59-0.2	End of hole at 0.75 m bgl, NDD refusal.
<b>Fill</b> Gravel and sandy clay (intermixed), brown-orange with some grey, mist, soft, medium plasticity, clay increasing with depth. Sandstone, shale, siltstone and coal fine gravel to cobbles throughout, poorly sorted, sub angular, no evidence of impact.								0.1		
End of Log			1							
			2							
			3							
			4							
			5							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB61**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **14/11/2013** Total Depth (m): **0.55** Final Water Level (m bgl): -  
 Drill Finish Date: **14/11/2013** Hole Diam. / Width (mm): **300** Elevation (Ground): -  
 Drill Co: **Cardno** Casing Type: **None** Elevation (Case): -  
 Driller: **Simon King** Casing Diam. (mm): - Easting (MGA): **223890**  
 Drill Method: **NDD** Surface Completion: **Topsoil** Northing (MGA): **6305109**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Topsoil</b> Clay with some sand, dark brown, rounded gravels, dry, low plasticity, homogenous, organic matter (roots/ rootlets), no evidence of impact.			0.2					0.2		
<b>Fill</b> Gravelly clay, orange with some fine to medium angular gravels, poorly sorted, no evidence of impact.			0.3	■	DS	Y		0.3	MK_SB61_0.4	End of hole at 0.55 m bgl, NDD refusal on cobbles.
<b>Fill</b> Gravelly clay with some sand, dark brown, fine to coarse angular gravels, poorly sorted, non-plastic, no evidence of impact, large cobble encountered at 0.55m.			1							
End of Log			2							
			3							
			4							
			5							
			6							

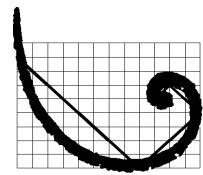
**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB62**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **6/11/2013** Total Depth (m): **1.3** Final Water Level (m bgl): -  
 Drill Finish Date: **6/11/2013** Hole Diam. / Width (mm): **300** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Justin Collyer** Casing Diam. (mm): - Easting (MGA): **223907**  
 Drill Method: **NDD** Surface Completion: **Topsoil** Northing (MGA): **6305052**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Gravelly clay, brown, dry, poorly sorted, coarse gravels <50 mm (30%) angular, no staining, rootlets, some building rubble (tile, terracotta).			0		DS	Y		0.2	MK_SB62_0.2	
								0.1		
			1					0.1		
<b>Fill</b> Sandy gravel with some cobbles, brown, poorly sorted, coarse angular gravels < 100 mm (90%), no staining, no odour.										End of hole at 1.3 m bgl, NDD refusa on cobbles.
End of Log										
			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MK\_SB63**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>27/11/2013</b>	Total Depth (m): <b>0.1</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>27/11/2013</b>	Hole Diam. / Width (mm): <b>150</b>	Elevation (Ground): -
Drill Co: <b>ERM</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Thavone Shaw</b>	Casing Diam. (mm): -	Easting (MGA): <b>223915</b>
Drill Method: <b>HA</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6305020</b>
Hole Type: <b>Surface Sample</b>	Water Strike (m bgl): -	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Topsoil</b> Clay, brown, dry, very fine, loose, medium plasticity, roots/ rootlets, no evidence of impact.			0		DS	Y		1	MK_SB63_0.03	
End of Log			1							
			2							
			3							
			4							

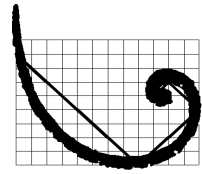
**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB64**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **27/11/2013** Total Depth (m): **0.1** Final Water Level (m bgl): -  
 Drill Finish Date: **27/11/2013** Hole Diam. / Width (mm): **150** Elevation (Ground): -  
 Drill Co: **ERM** Casing Type: **None** Elevation (Case): -  
 Driller: **Thavone Shaw** Casing Diam. (mm): - Easting (MGA): **223902**  
 Drill Method: **HA** Surface Completion: **Backfill** Northing (MGA): **6304955**  
 Hole Type: **Surface Sample** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Topsoil</b> Clay, brown, dry, medium plasticity, roots/ rootlets, some pockets of fine to course angular sands and fine gravel <3 mm, loose, no evidence of impact.			0		DS	Y		0.5	MK_SB64_0.05	
End of Log			1							
			2							
			3							
			4							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB65 / MK\_MW11**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>7/11/2013</b>	Total Depth (m): <b>5.0</b>	Final Water Level (m bgl): <b>3.277</b>
Drill Finish Date: <b>22/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>942.836</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>940.199</b>
Driller: <b>Jared Mudie</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223934.308</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Gatic</b>	Northing (MGA): <b>6304901.888</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>2.7</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Topsoil</b> Clay, brown, dry grained, homogenous, no evidence of impact, organic matter (roots/ rootlets).			0					0.6		
<b>Fill</b> Gravelly clay, dark brown, homogenous, poorly sorted, coarse angular gravels, no evidence of impact, some sand and orange mottling at 1.0m, gravels < 300 mm (40%), very stiff.			0.2	■	DS	Y		0.2	MK_SB65_0.5	
			1	■	DS	Y		0.2	MK_SB65_1.0	
			2					0.2		
<b>Fill</b> Gravelly clay, dark brown-black, moist, fine black angular gravels (40%), poorly sorted, homogenous, low plasticity, no evidence of impact. Coarser gravels from 2.7m, becoming wet and stiff with rare siltstone gravels.			3					0.2		
<b>Sandy Clay</b> Pale brown with gravel inclusions with some orange mottles, wet, soft, angular gravels < 40mm (20%), some coarse sands, poorly sorted, low plasticity, no evidence of impact.			4	■	US	Y		0.1	MK_SB65_3.5	
<b>Fill</b> Gravelly clay, dark brown, wet, soft fine to coarse, angular gravels with some coarse to rounded, orange sandstone gravels from 4.0m, poorly sorted, low plasticity, no evidence of impact, some cobbles at 4.5m.			5							End of hole at 5.0 m bgl, target depth achieved.
End of Log			6							

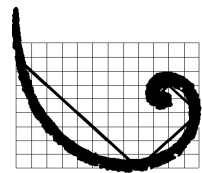
**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB66**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>27/11/2013</b>	Total Depth (m): <b>0.1</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>27/11/2013</b>	Hole Diam. / Width (mm): <b>150</b>	Elevation (Ground): -
Drill Co: <b>ERM</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Thavone Shaw</b>	Casing Diam. (mm):	Easting (MGA): <b>223966</b>
Drill Method: <b>HA</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6304803</b>
Hole Type: <b>Surface Sample</b>	Water Strike (m bgl): -	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Clay with some sand, brown, slightly moist, fine to medium grained, sands, angular, no evidence of impact, rootlets.			0		DS	Y		0.3	MK_SB66_0.05	
End of Log			1							
			2							
			3							
			4							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB67**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>27/11/2013</b>	Total Depth (m): <b>0.1</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>27/11/2013</b>	Hole Diam. / Width (mm): <b>150</b>	Elevation (Ground): -
Drill Co: <b>ERM</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Thavone Shaw</b>	Casing Diam. (mm):	Easting (MGA): <b>223923</b>
Drill Method: <b>HA</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6304793</b>
Hole Type: <b>Surface Sample</b>	Water Strike (m bgl): -	

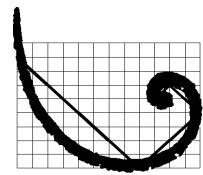
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Topsoil</b> Clay with some gravel, brown, dry, fine to coarse angular gravels <30mm (20%), no evidence of impact.	??		0	■	DS	Y		0	MK_SB67_0.05	
End of Log			1							
			2							
			3							
			4							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB68**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **15/10/2013** Total Depth (m): **6.8** Final Water Level (m bgl): **3.185**  
 Drill Finish Date: **16/10/2013** Hole Diam. / Width (mm): **150** Elevation (Ground): **937.955**  
 Drill Co: **Numac** Casing Type: **uPVC** Elevation (Case): **937.886**  
 Driller: **Rohan Harding** Casing Diam. (mm): **50** Easting (MGA): **223965.087**  
 Drill Method: **NDD/PT/SFA** Surface Completion: **Gatic** Northing (MGA): **6305320.671**  
 Hole Type: **Monitoring Well** Water Strike (m bgl): **3.5**

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Topsoil</b> Clayey sandy silt, moist, brown, medium stiffness, low plasticity, homogenous, no evidence of impact.			0	■	DS	Y		0	MK-SB68-0.1	
<b>Gravelly Sand</b> Pale grey, moist, medium density, fine sand to coarse gravel, moderately sorted, rounded, no evidence of impact.			1	■	DS	Y		1	MK-SB68-0.5	
<b>Sandstone</b> Weathered, orange-brown to grey, dense, fine, moderately coarse, well sorted, rounded, no evidence of impact.			1					0.7		
<b>Sandy clay</b> With gravel, dark brown with black, grey and orange-brown mottling, moist, hard, friable, non plastic, heterogeneous with coarse gravel comprising coal and sandstone, interbedded with grey siltstone from 1.7m, no evidence of impact.			2					3.1		
			2					3.7		
			3					3.5		
			4	■	DS	Y		3.7	MK-SB68-4.0	
			5					3.3		
<b>Clayey Sand</b> Dark grey with orange-brown and grey mottling, moist, medium density, fine to coarse sands, moderately sorted, well rounded, no staining, no odour.			6					2.8		

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: MK\_SB68**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>15/10/2013</b>	Total Depth (m): <b>6.8</b>	Final Water Level (m bgl): <b>3.185</b>
Drill Finish Date: <b>16/10/2013</b>	Hole Diam. / Width (mm): <b>150</b>	Elevation (Ground): <b>937.955</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>937.886</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223965.087</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Gatic</b>	Northing (MGA): <b>6305320.671</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>3.5</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
										End of hole at 6.8 m bgl, target depth achieved.
End of Log			7 8 9 10 11 12							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB69**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>27/11/2013</b>	Total Depth (m): <b>0.1</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>27/11/2013</b>	Hole Diam. / Width (mm): <b>150</b>	Elevation (Ground): -
Drill Co: <b>ERM</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Thavone Shaw</b>	Casing Diam. (mm):	Easting (MGA): <b>223977</b>
Drill Method: <b>HA</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6305082</b>
Hole Type: <b>Surface Sample</b>	Water Strike (m bgl): -	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Topsoil</b> Clay, brown, dry, fine grained, homogenous, low plasticity, root/rootlets.			0		DS	Y		0.9	MK_SB69_0.05	
End of Log			1							
			2							
			3							
			4							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB71**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **12/11/2013** Total Depth (m): **3.0** Final Water Level (m bgl): -  
 Drill Finish Date: **20/11/2013** Hole Diam. / Width (mm): **200** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Jared Mudie** Casing Diam. (mm): Easting (MGA): **223957**  
 Drill Method: **NDD/PT** Surface Completion: **Topsoil** Northing (MGA): **6305003**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Topsoil</b> Clay, brown, dry, very fine gravel, homogenous, no staining, organic matter (roots and rootlets). <b>Fill</b> Gravelly clay with some cobbles, brown, fine angular black and orange gravels <10mm to round to angular coarse gravels <50 mm (50%), very stiff, poorly sorted, no staining.			0					0.1		
			0.5	■	DS	Y			MK_SB71_0.5	
			1.1	■	DS	Y		1.1	MK_SB71_1.8	
<b>Fill</b> Gravelly clay, dark grey-black, dry, fine shale and coal gravels <10mm, angular, no evidence of impact, very stiff, non-plastic.			2							
			3							End of hole at 3.0 m bgl, target depth achieved.
End of Log			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB72**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **7/11/2013** Total Depth (m): **1.0** Final Water Level (m bgl): -  
 Drill Finish Date: **7/11/2013** Hole Diam. / Width (mm): **300** Elevation (Ground): -  
 Drill Co: **Cardno** Casing Type: **None** Elevation (Case): -  
 Driller: **Simon King** Casing Diam. (mm): Easting (MGA): **223967**  
 Drill Method: **NDD** Surface Completion: **Backfill** Northing (MGA): **6304948**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Clayey gravel (road base), grey, dry, coarse, angular, gravels <30 mm, homogenous, no staining, becoming orange at 0.05m.			0.1					0.1		
<b>Fill</b> Gravelly clay, brown, dry, coarse, angular gravels <30 mm (30%), no staining, some cobbles.			0.3		DS	Y		0.3	MK_SB72_0.5	
<b>Fill</b> Clay with some gravels, dark brown, mottled orange, gravels <10 mm (10%), no staining.			1							End of hole at 1.0 m bgl, encountered underground service.
End of Log										
			2							
			3							
			4							
			5							
			6							

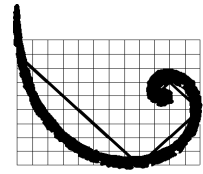
**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB75**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>27/11/2013</b>	Total Depth (m): <b>0.1</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>27/11/2013</b>	Hole Diam. / Width (mm): <b>150</b>	Elevation (Ground): -
Drill Co: <b>ERM</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Thavone Shaw</b>	Casing Diam. (mm):	Easting (MGA): <b>224019</b>
Drill Method: <b>HA</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6304990</b>
Hole Type: <b>Surface Sample</b>	Water Strike (m bgl): -	

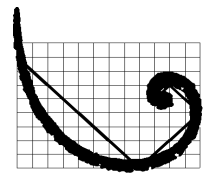
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Topsoil</b> Clay with rare gravel, brown, dry, homogenous, medium plasticity, root/ rootlets, no evidence of impact.			0		DS	Y		0.3	MK_SB75_0.05	
End of Log			1							
			2							
			3							
			4							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB76 / MK\_MW06**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>29/10/2013</b>	Total Depth (m): <b>5.0</b>	Final Water Level (m bgl): <b>4.695</b>
Drill Finish Date: <b>6/11/2013</b>	Hole Diam. / Width (mm): <b>150</b>	Elevation (Ground): <b>938.077</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>938.058</b>
Driller: <b>Jared Mudie</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224090.732</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6305163.534</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>2.0</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Silty sand with gravel, brown, dry, dense, fine sand to pebble gravels, moderately sorted, no evidence of impact.			0.8		DS	Y		0.8	MK_SB76_0.2	
<b>Clay</b> Orange-brown with pale grey mottles, no evidence of impact.			0.9		DS	Y		0.9	MK_SB76_0.5	
<b>Clay</b> Orange-brown with olive brown mottles, moist, moderately stiff, high plasticity, no evidence of impact.			1.0					0.6		
<b>Fill</b> Clayey sand with gravel, brown, moist, medium density, fine sand to cobbles, poorly sorted, sub-rounded, no evidence of impact.			2.0					0.2		
<b>Clay</b> Grey with brown mottles, moist, soft, medium plasticity, homogenous, no evidence of impact.			2.6					0.3		
			3.0		US	Y		3.3	MK_SB76_3.0	
<b>Clayey Sand</b> Dark grey with gravel inclusions, moist, medium density, fine sand to cobbles, moderately sorted, no evidence of impact.			4.0					3.2		
			5.0					2.6		End of hole at 5.0 m bgl, target depth achieved.
End of Log			6.0							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB78 / MK\_MW08**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **7/11/2013**  
 Drill Finish Date: **20/11/2013**  
 Drill Co: **Numac**  
 Driller: **Jared Mudie**  
 Drill Method: **NDD/PT/SFA**  
 Hole Type: **Monitoring Well**

Total Depth (m): **6.3**  
 Hole Diam. / Width (mm): **125**  
 Casing Type: **uPVC**  
 Casing Diam. (mm): **50**  
 Surface Completion: **Gatic**  
 Water Strike (m bgl): **3.7**

Final Water Level (m bgl): **6.236**  
 Elevation (Ground): **940.202**  
 Elevation (Case): **940.183**  
 Easting (MGA): **224061.577**  
 Northing (MGA): **6305041.807**

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks	
Ground Surface			0								
<b>Fill</b> Gravelly clay with some sand at 1m, brown with brown-orange mottles (1m), becoming brown-black (1.6m), dry, gravels <30mm (50%), poorly sorted, gravels increase in size with depth, some cobbles <200mm, non plastic, organic matter, no staining, no odour.			0					0.2			
			0.1	■	DS	Y			0.1	MK_SB78_0.5	
			1							0.3	
			2								
<b>Sandstone</b> Orange-grey, dry, medium-coarse grained, angular, homogenous, no evidence of impact.			3								
<b>Siltstone</b> Pale grey, dry, layered, very fine grained, homogenous.			3.5								
<b>Coal</b> Black, slightly moist, homogenous.			4	■	DS	Y		0.7	MK_SB78_3.9		
<b>Clay</b> Dark grey-black with coal gravels, moist, angular gravels <20mm (50%), poorly sorted, stiff, no evidence of impact, becoming dark brown at 3.9m with some fine orange gravels.			4.9					0.3			
<b>Siltstone</b> Pale grey, moist, very fine grained, very stiff, homogenous.			5.5								
<b>Clay</b> With gravels, dark grey, moist, fine angular black gravels and coarse well rounded grey sandstone gravels (40mm).			6								
<b>Sand</b> Grey, medium to coarse grained, wet, angular to rounded, homogenous.			6.3								
<b>Clay</b> With gravels, dark grey, moist, fine angular siltstone and coal gravels, interbedded with siltstone and sandstone from 4.9m.			6.9								
End of Log										End of hole at 6.3 m bgl, target depth achieved.	

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB79**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>7/11/2013</b>	Total Depth (m): <b>3.0</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>20/11/2013</b>	Hole Diam. / Width (mm): <b>300</b>	Elevation (Ground): -
Drill Co: <b>Numac</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Jared Mudie</b>	Casing Diam. (mm):	Easting (MGA): <b>224089</b>
Drill Method: <b>NDD/PT</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6305002</b>
Hole Type: <b>Soil Bore</b>	Water Strike (m bgl): -	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Gravelly clay, brown, dry, gravels <10mm (20%), angular, homogenous, poorly sorted, no staining, organic matter (roots), gravels becoming coarser with depth <30 mm diameter at 0.5m, cobbles from 0.6m, becoming orange at 2.1m.								0.3		
					DS	Y		0.3	MK_SB79_0.5	
									0.1	
<b>Fill</b> Sandy clay with some gravel, yellow-brown becoming dark brown-grey at 2.7m, slightly moist, fine to medium angular sands, fine black gravel <5 mm to coarse angular and rounded coal, siltstone and sandstone gravel, low plasticity, no evidence of impact.			3					0.9		End of hole at 3.0 m bgl, target depth achieved.
End of Log			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB81**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **29/10/2013** Total Depth (m): **3.9** Final Water Level (m bgl): -  
 Drill Finish Date: **6/11/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Jared Mudie** Casing Diam. (mm): Surface Completion: **Backfill** Easting (MGA): **224131**  
 Drill Method: **NDD/PT** Surface Completion: **Backfill** Northing (MGA): **6305175**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Silty Sand</b> Brown with gravel inclusions, moist, medium density, fine sand to cobbles, poorly sorted, no evidence of impact.			0.2					0.2		
			0.4					0.4		
<b>Sandy Clay</b> Dark brown with gravel inclusions, moist, soft, low plasticity, heterogeneous with clay and fine sand cobbles intermixed, no evidence of impact, shale coal and sandstone cobbles.			0.8	█		Y		0.8	MK_SB81_1.0	
			0.6					0.6		
			0.7					0.7		
<b>Sandstone</b> Weathered, grey, moist, dense, fine to coarse sands, well sorted, no evidence of impact.			3.0	█		Y		0.6	MK_SB81_3.0	
<b>Clay</b> Brown, wet, soft, moderate plasticity, homogenous, no evidence of impact.										
<b>Sandstone</b> Weathered, grey, moist, dense, fine to coarse sands, well sorted, no evidence of impact.										
			1.1					1.1		End of hole at 3.9 m bgl, target depth achieved.
End of Log			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB82**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **29/10/2013** Total Depth (m): **3.9** Final Water Level (m bgl): -  
 Drill Finish Date: **6/11/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Jared Mudie** Casing Diam. (mm): - Easting (MGA): **224117**  
 Drill Method: **NDD/PT** Surface Completion: **Backfill** Northing (MGA): **6305148**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Clayey sand with gravel, brown, moist, medium density, fine, sand to pebbles, poorly sorted, no evidence of contamination.  <b>Clay</b> Orange-brown with pale grey mottles, moist, medium stiff, high plasticity, homogenous, no evidence of impact.			0		DS	Y		1.6	MK_SB82_0.2	
			1						1.4	
<b>Sandy Clay</b> With gravel, brown with olive brown mottles inclusions, wet, soft, low plasticity, heterogeneous with inclusions of coal, siltstone and sandstone gravels.			1					0.7		
			2					0.1		
			3					0.2		
			3		US	Y		0.2	MK_SB82_3.9	End of hole at 3.9 m bgl, target depth achieved.
End of Log			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB84**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>6/11/2013</b>	Total Depth (m): <b>1.5</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>6/11/2013</b>	Hole Diam. / Width (mm): <b>200</b>	Elevation (Ground): -
Drill Co: <b>Cardno</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Simon King</b>	Casing Diam. (mm): -	Easting (MGA): <b>224140</b>
Drill Method: <b>NDD</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6305002</b>
Hole Type: <b>Soil Bore</b>	Water Strike (m bgl): -	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Gravelly clay, brown, dry, poorly sorted, coarse, angular gravels <150 mm, becoming moderately plastic at 0.5m, mottled grey and orange at 0.9 m with fewer gravels, no staining, no odour, roots.			0		DS	Y		0.1	MK_SB84_0.2	End of hole at 1.5 m bgl.
			0.1					0.1		
			1					0.1		
End of Log			2							
			3							
			4							
			5							
			6							

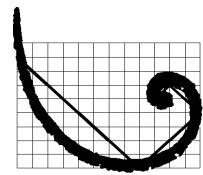
**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB86**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **29/10/2013** Total Depth (m): **3.9** Final Water Level (m bgl): -  
 Drill Finish Date: **6/11/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Jared Mudie** Casing Diam. (mm): - Easting (MGA): **224695**  
 Drill Method: **NDD/PT** Surface Completion: **Backfill** Northing (MGA): **6305193**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Asphalt</b>										
<b>Fill</b> Silty sand (roadbase) with gravel, orange, moist, dense, fine sand to pebble gravels, poorly sorted, no evidence of impact.			0.3					0.3		
			0.7	■	DS	Y		0.7	MK_SB86_0.5	
<b>Fill</b> Sandy clay with gravels, brown with orange-brown and grey mottles, moist, stiff, soft from 0.4m, moderate plasticity, heterogeneous with intermixed fine sand to cobbles.			1					0.5		
			2.3	■	DS	Y		2.3	MK_SB86_1.5	
			2					0.6		
			3					0.8		
			3.9					3.9		End of hole at 3.9 m bgl, target depth achieved.
End of Log			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB87**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>28/10/2013</b>	Total Depth (m): <b>7.0</b>	Final Water Level (m bgl): <b>3.133</b>
Drill Finish Date: <b>31/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>940.266</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>940.204</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223654.333</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Gatic</b>	Northing (MGA): <b>6304969.759</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>5.0</b>	

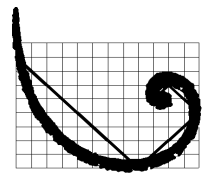
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Topsoil</b> Sandy silt, brown, dry, non-plastic, medium stiffness, homogenous, no evidence of impact.			0							
<b>Fill</b> Silty sand, brown, moist, medium density, fine sand to cobbles, poorly sorted, sub-rounded, odour apparent form 0.8 m, no staining.			0.2		DS	Y		0.2	MK_SB87_0.5	
			1		DS	Y		262.6	MK_SB87_1.0	
<b>Fill</b> Silty sand, orange-brown and grey mottled moist, fine sand to cobbles, moderately sorted, no evidence of impact.			0.4					0.4		
			0.6					0.6		
<b>Siltstone</b> Weathered, grey, moist, fine grained, well sorted, no evidence of impact.			3		US	Y		0.6	MK_SB87_3.0	
<b>Siltstone</b> Grey, dry, hard, very fine, grained, no evidence of impact.			4							
<b>Sandstone</b> Grey, moist, hard, fine to medium coarse, no evidence of impact, coarse sand and coarse gravel from 6 - 7m.			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **MK\_SB87**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>28/10/2013</b>	Total Depth (m): <b>7.0</b>	Final Water Level (m bgl): <b>3.133</b>
Drill Finish Date: <b>31/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>940.266</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>940.204</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223654.333</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Gatic</b>	Northing (MGA): <b>6304969.759</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>5.0</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			7							End of hole at 7.0 m bgl, target depth achieved.
End of Log			8							
			9							
			10							
			11							
			12							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **G. Powell**  
 Checked By: **A. Ashworth**  
 Page 2 of 2

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_MW02**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **1/11/2013** Total Depth (m): **0.6** Final Water Level (m bgl): -  
 Drill Finish Date: **1/11/2013** Hole Diam. / Width (mm): **300** Elevation (Ground): -  
 Drill Co: **Cardno** Casing Type: **None** Elevation (Case): -  
 Driller: **Nathan Kelleher** Casing Diam. (mm): - Easting (MGA): **224126**  
 Drill Method: **NDD** Surface Completion: **Backfill** Northing (MGA): **6304805**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Clayey cobbles with gravel, dark brown, dry, large angular cobbles 300mm, poorly sorted, rootlets, no evidence of contamination, becoming orange brown at 0.1m.					DS	Y		0.1	ML_MW02_0.2	End of hole at 0.6 m bgl, NDD refusal on black boulder.
End of Log			1							
			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_MW03**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>16/10/2013</b>	Total Depth (m): <b>24.5</b>	Final Water Level (m bgl): <b>Dry</b>
Drill Finish Date: <b>30/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>965.919</b>
Drill Co: <b>Numac</b>	Casing Type: <b>PVC</b>	Elevation (Case): <b>966.594</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223807.068</b>
Drill Method: <b>NDD/SFA</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304186.698</b>
Hole Type: <b>Monitoring well</b>	Water Strike (m bgl): <b>-</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Clayey gravel, black, dry, cobbles to 200mm (30%) between 1.2 - 1.4 m,			0		DS	Y			ML-MW03-0.2	
<b>Fill</b> Clayey gravel, brown, mottled orange - brown, slightly moist, medium plasticity, fine gravels 5-50mm (20%), angular, no odour, no staining.			1		DS	Y			ML_MW03_1.7	
<b>Siltstone</b> Pale grey, very fine to fine grained, homogenous, becoming pale orange-grey from 3.5 - 3.6 and 3.8 - 4.1m.			2							
<b>Shale</b> Dark grey, very fine grained, layered, homogenous, dry.			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_MW03**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>16/10/2013</b>	Total Depth (m): <b>24.5</b>	Final Water Level (m bgl): <b>Dry</b>
Drill Finish Date: <b>30/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>965.919</b>
Drill Co: <b>Numac</b>	Casing Type: <b>PVC</b>	Elevation (Case): <b>966.594</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223807.068</b>
Drill Method: <b>NDD/SFA</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304186.698</b>
Hole Type: <b>Monitoring well</b>	Water Strike (m bgl): <b>-</b>	

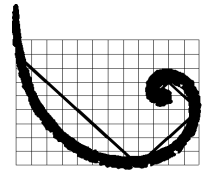
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			7							
			8							
			9							
			10							
			11							
			12							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**  
 Page 2 of 5

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_MW03**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>16/10/2013</b>	Total Depth (m): <b>24.5</b>	Final Water Level (m bgl): <b>Dry</b>
Drill Finish Date: <b>30/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>965.919</b>
Drill Co: <b>Numac</b>	Casing Type: <b>PVC</b>	Elevation (Case): <b>966.594</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223807.068</b>
Drill Method: <b>NDD/SFA</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304186.698</b>
Hole Type: <b>Monitoring well</b>	Water Strike (m bgl): <b>-</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			13							
<b>Sandstone</b> Dark grey, fine grained, well rounded, moist, no odour.			14							
<b>Shale</b> Dark grey - black, very fine grained, layered, homogenous, dry, some weathering between 14 - 15m (orange brown clay).			15							
<b>Siltstone</b> Pale grey, very fine grained, laminated with dark grey - black silt.			16							
<b>Coal</b> Black			17							
<b>Siltstone</b> Dark brown, very fine grained, homogenous, dry.			18							
<b>Shale</b> Dark grey - black, very fine grained, layered, homogenous, dry.										

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_MW03**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>16/10/2013</b>	Total Depth (m): <b>24.5</b>	Final Water Level (m bgl): <b>Dry</b>
Drill Finish Date: <b>30/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>965.919</b>
Drill Co: <b>Numac</b>	Casing Type: <b>PVC</b>	Elevation (Case): <b>966.594</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223807.068</b>
Drill Method: <b>NDD/SFA</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304186.698</b>
Hole Type: <b>Monitoring well</b>	Water Strike (m bgl): <b>-</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
<b>Sandstone</b> Grey, very fine grained, well rounded, slightly moist, becoming fine to medium grained at 20m, sub angular grains.			19 20 21 22 23 24							
<b>Coal</b> Black			23 24							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_MW03**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>16/10/2013</b>	Total Depth (m): <b>24.5</b>	Final Water Level (m bgl): <b>Dry</b>
Drill Finish Date: <b>30/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>965.919</b>
Drill Co: <b>Numac</b>	Casing Type: <b>PVC</b>	Elevation (Case): <b>966.594</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223807.068</b>
Drill Method: <b>NDD/SFA</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304186.698</b>
Hole Type: <b>Monitoring well</b>	Water Strike (m bgl): <b>-</b>	

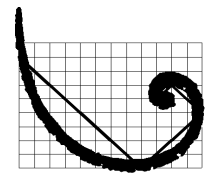
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
<b>Shale</b> Dark grey - black, very fine grained, homogenous.										End of hole at 24.5 m bgl, target depth achieved.
End of Log			25							
			26							
			27							
			28							
			29							
			30							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_MW05**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>16/10/2013</b>	Total Depth (m): <b>18.1</b>	Final Water Level (m bgl): <b>16.890</b>
Drill Finish Date: <b>31/10/2013</b>	Hole Diam. / Width (mm): <b>200</b>	Elevation (Ground): <b>972.023</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>972.861</b>
Driller: <b>Jared Mudie</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224230.841</b>
Drill Method: <b>NDD</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304374.026</b>
Hole Type: <b>Monitoring well</b>	Water Strike (m bgl): <b>15.0</b>	

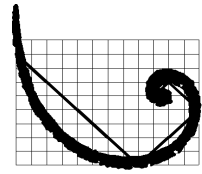
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Clayey Gravel</b> Dark brown, dry, poorly sorted, angular gravels, no staining, no odour, roots and rootlets, 300 mm cobbles  <b>Clay</b> With some gravles and cobbles, dark brown with some orange mottles, angular gravels <50mm, increasing cobbles <250mm from approximately 0.9m, medium plasticity, homogenous, no staining, no odour. rootlets.			0		DS	Y			ML-MW05-0.5	
<b>Clay</b> Pale yellow-brown becoming mottled orange at 2.5m, moist, high plasticity, rare medium grained angular gravels, homogenous, no odour, no evidenc of contamination.			1					0		
<b>Clay</b> Pale yellow-brown becoming mottled orange at 2.5m, moist, high plasticity, rare medium grained angular gravels, homogenous, no odour, no evidenc of contamination.			2					0.2	T01_311013_TS	
<b>Gravelly Clay</b> Brown, dry, medium plasticity, homogenous, fine shale gravel, angular, no staining, no odour.			3		DS	Y				
			4							
			5					0.1		
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_MW05**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>16/10/2013</b>	Total Depth (m): <b>18.1</b>	Final Water Level (m bgl): <b>16.890</b>
Drill Finish Date: <b>31/10/2013</b>	Hole Diam. / Width (mm): <b>200</b>	Elevation (Ground): <b>972.023</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>972.861</b>
Driller: <b>Jared Mudie</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224230.841</b>
Drill Method: <b>NDD</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304374.026</b>
Hole Type: <b>Monitoring well</b>	Water Strike (m bgl): <b>15.0</b>	

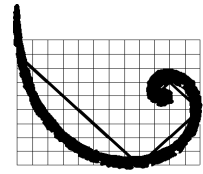
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
<b>Shale</b> Dark grey, very fine grained, dry, homogenous.			7							
			8							
			9							
			10							
			11							
			12							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**  
 Page 2 of 3

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_MW05**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>16/10/2013</b>	Total Depth (m): <b>18.1</b>	Final Water Level (m bgl): <b>16.890</b>
Drill Finish Date: <b>31/10/2013</b>	Hole Diam. / Width (mm): <b>200</b>	Elevation (Ground): <b>972.023</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>972.861</b>
Driller: <b>Jared Mudie</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224230.841</b>
Drill Method: <b>NDD</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304374.026</b>
Hole Type: <b>Monitoring well</b>	Water Strike (m bgl): <b>15.0</b>	

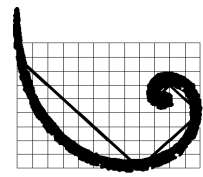
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
<b>Coal</b> Black, dry										
<b>Shale</b> Dark grey, very fine grained, dry, homogenous.			13							
<b>Siltstone</b> Pale grey, very fine grained, dry, homogenous.			14							
<b>Shale</b> Dark grey - black, very fine grained, dry, homogenous.			15							
<b>Coal</b> Black			16							
<b>Siltstone</b> Pale grey, very fine grained, wet, homogenous, becoming dry at 17.9m.			17							
			18							End of hole at 18.1 m bgl, target depth achieved.
End of Log										

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_MW07**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>8/11/2013</b>	Total Depth (m): <b>5.0</b>	Final Water Level (m bgl): <b>4.992</b>
Drill Finish Date: <b>20/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>920.218</b>
Drill Co: <b>Numac</b>	Casing Type: <b>PVC</b>	Elevation (Case): <b>920.904</b>
Driller: <b>Jared Mudie</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>224490.957</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6305982.259</b>
Hole Type: <b>Monitoring well</b>	Water Strike (m bgl): <b>3.5</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Gravelly clay, brown, dry, fine to coarse gravels <75mm (50%), some cobbles, poorly sorted, no staining, organic matter (roots / rootlets), cobbles increasing at depth, no cobbles from 1.5m.			0							
			0.4	DS	Y		0.4	ML-MW07-0.2		
<b>Fill</b> Gravelly clay, dark grey, moist, becoming wet between 2 - 2.9m, soft, angular coal shale, and oragne sandstone gravels <40mm, high plasticity.			0.2							
			1							
<b>Clay</b> Brown, moist, rare angular gravels <40mm (5%), some red mottling, high plasticity, homogenous, no evidence of contamination, wet at 3.5m, organic matter (fibrous material).			2							
			2	DS	Y		1	ML_MW07_2.0		
			3							
			4					0.7		
End of Log			5							End of hole at 5.0 m bgl, target depth achieved.
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

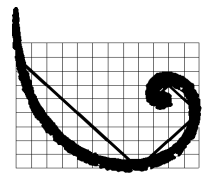
Log By: **T. Shaw**

Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_MW10**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>16/10/2013</b>	Total Depth (m): <b>17.0</b>	Final Water Level (m bgl): <b>14.510</b>
Drill Finish Date: <b>29/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>974.752</b>
Drill Co: <b>Numac</b>	Casing Type: <b>PVC</b>	Elevation (Case): <b>975.418</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>222533.140</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6305045.977</b>
Hole Type: <b>Monitoring well</b>	Water Strike (m bgl): <b>12.8</b>	

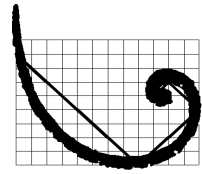
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Clayey Gravel</b> Brown-orange, dry, no staining, no odour, siltstone cobbles to 150mm (30%), mottled grey at 1.5m.			0	■	DS	Y			ML-MW10-0.2	
			1.6							
<b>Clay</b> Grey, dry, plastic, homogenous, organic matter (fibrous material), no odour, no staining.			1.8	■	US	Y		1.8	ML_MW10_1.6	
<b>Coal</b> Weathered, black, dry, non plastic, medium soft, organic like odour, tan clay between 1.9 - 1.95m.			1.95					1.3		
<b>Siltstone</b> Dark brown - grey, very fine orange sands, angular to rounded, homogenous, no odour, becoming grey at 3m.			3.0					1.8		
			5.0							
<b>Shale</b> Dark grey - black, fine grained.			6.0							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_MW10**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>16/10/2013</b>	Total Depth (m): <b>17.0</b>	Final Water Level (m bgl): <b>14.510</b>
Drill Finish Date: <b>29/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>974.752</b>
Drill Co: <b>Numac</b>	Casing Type: <b>PVC</b>	Elevation (Case): <b>975.418</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>222533.140</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6305045.977</b>
Hole Type: <b>Monitoring well</b>	Water Strike (m bgl): <b>12.8</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			7							
			8							
			9							
			10							
			11							
			12							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_MW10**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>16/10/2013</b>	Total Depth (m): <b>17.0</b>	Final Water Level (m bgl): <b>14.510</b>
Drill Finish Date: <b>29/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>974.752</b>
Drill Co: <b>Numac</b>	Casing Type: <b>PVC</b>	Elevation (Case): <b>975.418</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>222533.140</b>
Drill Method: <b>NDD/PT/SFA</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6305045.977</b>
Hole Type: <b>Monitoring well</b>	Water Strike (m bgl): <b>12.8</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
<b>Sandstone</b> Very fine grained, dark grey, moist, sub-rounded, no odour.  <b>Shale</b> Dark grey - black, fine grained.			13							
<b>Coal</b> Black  <b>Shale</b> Dark grey - black, fine grained.			16							
End of Log			17							End of hole at 17.0 m bgl, target depth achieved.
			18							

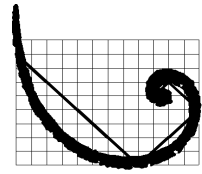
**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_MW12**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>16/10/2013</b>	Total Depth (m): <b>8.0</b>	Final Water Level (m bgl): <b>5.680</b>
Drill Finish Date: <b>25/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>954.714</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>955.484</b>
Driller: <b>Jared Mudie</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>222969.584</b>
Drill Method: <b>NDD/SFA/AH</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304324.154</b>
Hole Type: <b>Monitoring well</b>	Water Strike (m bgl): <b>7.0</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Gravelly clay with cobbles, brown, dry, low plasticity, angular gravels, no staining, no odour, rootlets, shale cobble between 0.7 - 1.0m.			0		DS	Y			ML_MW12_0.1	
<b>Fill</b> Sandy clay with some gravel, dark brown-grey, dry, fine to medium grained, fine angular gravels <5 mm, round to angular sands, friable. Becoming moist and soft at 3m, medium plasticity, homogenous, no evidence of contamination.			1							
<b>Siltstone</b> Orange brown, very slightly moist, becoming grey with depth, very fine grained, homogenous.			3							
			4							
			5							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_MW12**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>16/10/2013</b>	Total Depth (m): <b>8.0</b>	Final Water Level (m bgl): <b>5.680</b>
Drill Finish Date: <b>25/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>954.714</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>955.484</b>
Driller: <b>Jared Mudie</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>222969.584</b>
Drill Method: <b>NDD/SFA/AH</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304324.154</b>
Hole Type: <b>Monitoring well</b>	Water Strike (m bgl): <b>7.0</b>	

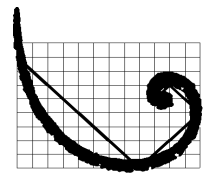
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
<b>Sandstone</b> Pale grey, slightly moist, fine to coarse grained angular sands with some sub-rounded fine gravels (10mm). Becoming medium to coarse grained and moist 7 - 8m, sub-angular to well rounded 8 - 9m, well sorted, rare gravels, no evidence of contamination.			6							
			7							
			8							End of hole at 8.0 m bgl, target depth achieved.
End of Log			9							
			10							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: ML\_MW14**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>28/11/2013</b>	Total Depth (m): <b>0.1</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>28/11/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): -
Drill Co: <b>ERM</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Thavone Shaw</b>	Casing Diam. (mm): -	Easting (MGA): <b>222774</b>
Drill Method: <b>NDD</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6305894</b>
Hole Type: <b>Surface sample</b>	Water Strike (m bgl): -	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Topsoil</b> Sandy clay with some gravel, brown, slightly moist, angular to rounded sands, some angular gravels <20 mm (10%), organic matter (root/rootlets), faint eucalypt like odour.			0		DS	Y	0.2	ML_MW14_0.1		
End of Log			1							
			2							
			3							
			4							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_MW15**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **16/10/2013** Total Depth (m): **15.9** Final Water Level (m bgl): **8.533**  
 Drill Finish Date: **28/10/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): **950.161**  
 Drill Co: **Numac** Casing Type: **uPVC** Elevation (Case): **950.881**  
 Driller: **Rohan Harding** Casing Diam. (mm): **50** Easting (MGA): **223329.968**  
 Drill Method: **NDD/SFA** Surface Completion: **Monument** Northing (MGA): **6304666.551**  
 Hole Type: **Monitoring well** Water Strike (m bgl): **-**

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Gravelly clay, brown, dry, angular gravels, low plasticity, poorly sorted, no staining, no odour, roots / rootlets, some cobbles 100mm.			0		DS	Y			ML-MW15-0.1	
<b>Clayey Sand</b> Brown, some gravel, dry, sands are medium grained, sub-rounded to rounded, poorly sorted.			2							
			3		DS	Y		1.9	ML_MW15_3.0	
<b>Siltstone</b> Dark grey, very fine grained, dry, some fine laminations, pale grey.			4							
No return from air hammer.			5							
			6							

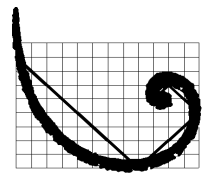
**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

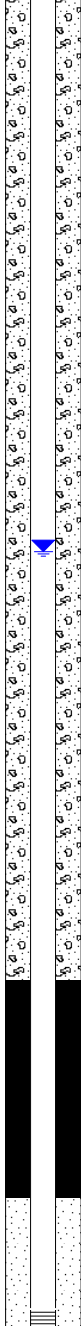
**ID: ML\_MW15**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>16/10/2013</b>	Total Depth (m): <b>15.9</b>	Final Water Level (m bgl): <b>8.533</b>
Drill Finish Date: <b>28/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>950.161</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>950.881</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223329.968</b>
Drill Method: <b>NDD/SFA</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304666.551</b>
Hole Type: <b>Monitoring well</b>	Water Strike (m bgl): <b>-</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			7							
			8							
			9							
			10							
			11							
			12							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**  
 Page 2 of 3

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

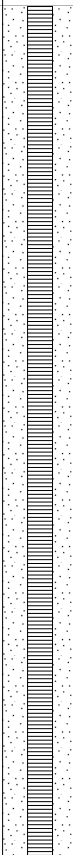
**ID: ML\_MW15**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>16/10/2013</b>	Total Depth (m): <b>15.9</b>	Final Water Level (m bgl): <b>8.533</b>
Drill Finish Date: <b>28/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>950.161</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>950.881</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223329.968</b>
Drill Method: <b>NDD/SFA</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304666.551</b>
Hole Type: <b>Monitoring well</b>	Water Strike (m bgl): <b>-</b>	

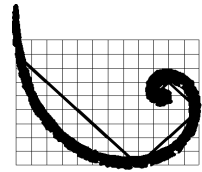
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			13 14 15							End of hole at 15.9 m bgl, target depth achieved.
End of Log			16 17 18							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**  
 Page 3 of 3

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: ML\_MW17**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>14/10/2013</b>	Total Depth (m): <b>0.7</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>14/10/2013</b>	Hole Diam. / Width (mm): <b>300</b>	Elevation (Ground): -
Drill Co: <b>Numac</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Scott Jessup</b>	Casing Diam. (mm): -	Easting (MGA): <b>223893</b>
Drill Method: <b>NDD</b>	Surface Completion: -	Northing (MGA): <b>6304375</b>
Hole Type: <b>Soil Bore</b>	Water Strike (m bgl): -	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Sandy clay, brown, dry, poorly sorted, no staining, no odour, gravels (10%) to cobbles (10%).					DS	Y			ML_MW17_0.2	
<b>Fill</b> Sandy gravel, black, poorly sorted, 30% sandy gravel matrix, 70% cobbles (shale and siltstone) 10-30 cm in diameter.										End of hole at 0.7 m bgl, NDD refusal on cobbles.
End of Log			1							
			2							
			3							
			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **A. Ashworth**  
 Checked By: **T. Shaw**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: ML\_MW18**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **16/10/2013** Total Depth (m): **0.75** Final Water Level (m bgl): -  
 Drill Finish Date: **16/10/2013** Hole Diam. / Width (mm): **300** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Scott Jessup** Casing Diam. (mm): - Easting (MGA): **223726**  
 Drill Method: **NDD** Surface Completion: **Backfill** Northing (MGA): **6304358**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Clayey Gravel</b> Black, non-plastic, angular gravels approximately 30mm in diameter, no odour, no staining, shale cobble inclusion approximately 250 mm in diameter.			0		DS	Y			ML-MW18-0.1	End of hole at 0.75 m bgl, NDD refusal on shale.
End of Log			1							
			2							
			3							
			4							
			5							
			6							

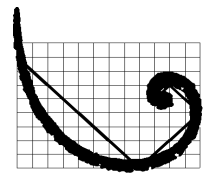
**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: -

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_MW19**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **14/10/2013** Total Depth (m): **0.25** Final Water Level (m bgl): -  
 Drill Finish Date: **14/10/2013** Hole Diam. / Width (mm): **300** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Scott Jessup** Casing Diam. (mm): - Easting (MGA): **223760**  
 Drill Method: **NDD** Surface Completion: **Backfill** Northing (MGA): **6304519**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Sandy Clay</b> Orange-brown, dry, no odour, no staining, cobble inclusion (5%) approximately 10-12cm, in diameter.			0		DS	Y			ML_MW19_0.1	
End of Log			0 1 2 3 4 5 6							End of hole at 0.25 m bgl, NDD refusal on shale.

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **A. Ashworth**  
 Checked By: **T. Shaw**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_MW20**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>14/10/2013</b>	Total Depth (m): <b>24.0</b>	Final Water Level (m bgl): <b>22.250</b>
Drill Finish Date: <b>17/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>959.742</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>960.532</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223646.358</b>
Drill Method: <b>NDD/SFA/AH</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304540.879</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>22.0</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Sandy silt with gravels, grey, dry, gravels (40%) range in diameter 10-100 mm.			0		DS	Y			ML_MW20_0.1	
<b>Shale</b> Red-brown, no evidence of contamination.			0 to 3							
<b>Siltstone</b> Orange-brown, very fine grained.			3 to 4							
<b>Siltstone</b> Grey, very fine grained.			4 to 6							

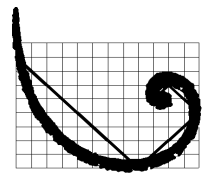
**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_MW20**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>14/10/2013</b>	Total Depth (m): <b>24.0</b>	Final Water Level (m bgl): <b>22.250</b>
Drill Finish Date: <b>17/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>959.742</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>960.532</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223646.358</b>
Drill Method: <b>NDD/SFA/AH</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304540.879</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>22.0</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			7							
			8							
			9							
<b>Shale</b> Black			10							
			11							
			12							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_MW20**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>14/10/2013</b>	Total Depth (m): <b>24.0</b>	Final Water Level (m bgl): <b>22.250</b>
Drill Finish Date: <b>17/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>959.742</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>960.532</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223646.358</b>
Drill Method: <b>NDD/SFA/AH</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304540.879</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>22.0</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			13							
<b>Siltstone</b> Dark grey, very fine grained.			14							
<b>Shale</b> Black			15							
<b>Siltstone</b> Dark grey, very fine grained.			16							
<b>Coal</b> Black			17							
<b>Shale</b> Black			18							
<b>Siltstone</b> Grey, very fine grained with fine to medium grained sands at 20 m. Becoming slightly moist at 20 m.										

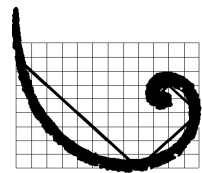
**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_MW20**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>14/10/2013</b>	Total Depth (m): <b>24.0</b>	Final Water Level (m bgl): <b>22.250</b>
Drill Finish Date: <b>17/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>959.742</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>960.532</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223646.358</b>
Drill Method: <b>NDD/SFA/AH</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304540.879</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>22.0</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			19							
			20							
			21							
<b>Coal</b> Black, wet at 22 m, no odour, no evidence of contamination.			22							
			23							
			24							End of hole at 24.0 m bgl, target depth achieved.
End of Log										

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**  
 Page 4 of 4

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_MW21**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **14/10/2013** Total Depth (m): **30.0** Final Water Level (m bgl): **Dry**  
 Drill Finish Date: **18/10/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): **962.315**  
 Drill Co: **Numac** Casing Type: **uPVC** Elevation (Case): **962.995**  
 Driller: **Rohan Harding** Casing Diam. (mm): **50** Easting (MGA): **223812.943**  
 Drill Method: **NDD/AH** Surface Completion: **Monument** Northing (MGA): **6304423.705**  
 Hole Type: **Monitoring Well** Water Strike (m bgl): **-**

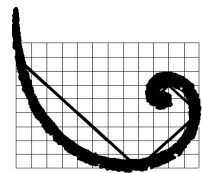
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Coal</b> Black			0		DS	Y			ML_MW21_0.1	
<b>Fill</b> Sandy gravel, black-grey, dry, poorly sorted, gravel 2-5 cm, cobbles 5-7 cm 910%, coal fragments present.			0.5							
<b>Shale</b> Black, fine ground, no evidence of contamination.			1							
			2							
			3							
<b>Siltstone</b> Light grey, dry, very fine, grained with some black grains, no evidence of contamination.			4							
			5							
			6							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **AA / TS**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_MW21**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>14/10/2013</b>	Total Depth (m): <b>30.0</b>	Final Water Level (m bgl): <b>Dry</b>
Drill Finish Date: <b>18/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>962.315</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>962.995</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223812.943</b>
Drill Method: <b>NDD/AH</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304423.705</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>-</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
<b>Shale</b> Dark grey-black, fine grained, becoming black at 9.5 m, layered, homogenous.			7							
			8							
			9							
			10							
			11							
			12							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **AA / TS**  
 Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_MW21**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>14/10/2013</b>	Total Depth (m): <b>30.0</b>	Final Water Level (m bgl): <b>Dry</b>
Drill Finish Date: <b>18/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>962.315</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>962.995</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223812.943</b>
Drill Method: <b>NDD/AH</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304423.705</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>-</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
<b>Siltstone</b> Very fine grained, dark grey, homogenous, becoming light grey with some black grains, some fine grain sand present at 15 m, lamination of grey fine grained sandy silt and black silt between 16.0- 19.9 m.			13 14 15 16							
<b>Sandstone</b> Fine grained, dark grey, rounded, well sorted, moist, interbedded with dark grey siltstone, between 17-18.5 m.			17 18							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **AA / TS**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_MW21**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>14/10/2013</b>	Total Depth (m): <b>30.0</b>	Final Water Level (m bgl): <b>Dry</b>
Drill Finish Date: <b>18/10/2013</b>	Hole Diam. / Width (mm): <b>125</b>	Elevation (Ground): <b>962.315</b>
Drill Co: <b>Numac</b>	Casing Type: <b>uPVC</b>	Elevation (Case): <b>962.995</b>
Driller: <b>Rohan Harding</b>	Casing Diam. (mm): <b>50</b>	Easting (MGA): <b>223812.943</b>
Drill Method: <b>NDD/AH</b>	Surface Completion: <b>Monument</b>	Northing (MGA): <b>6304423.705</b>
Hole Type: <b>Monitoring Well</b>	Water Strike (m bgl): <b>-</b>	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
<b>Coal</b> Black, dry.										
<b>Siltstone</b> Dark grey, dry, very fine grained with some fine grained sands, homogenous.			19							
<b>Siltstone</b> Pale grey, slightly moist, very fine grained.			20							
<b>Siltstone</b> Pale grey, slightly moist, very fine grained.			21							
<b>Siltstone</b> Pale grey, slightly moist, very fine grained.			22							
<b>Sandstone</b> Pale grey, slightly moist, fine to coarse grained, angular to well rounded.			23							
<b>Siltstone</b> Pale grey, very fine grained, slightly moist.			24							
<b>Coal</b> Black, dry.										
<b>Siltstone</b> Pale grey, very fine grained, slightly moist.										
<b>Coal</b> Black, dry.										
<b>Siltstone</b> Pale grey, very fine grained.										
<b>Coal</b> Black, dry.										

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **AA / TS**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_MW21**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **14/10/2013** Total Depth (m): **30.0** Final Water Level (m bgl): **Dry**  
 Drill Finish Date: **18/10/2013** Hole Diam. / Width (mm): **125** Elevation (Ground): **962.315**  
 Drill Co: **Numac** Casing Type: **uPVC** Elevation (Case): **962.995**  
 Driller: **Rohan Harding** Casing Diam. (mm): **50** Easting (MGA): **223812.943**  
 Drill Method: **NDD/AH** Surface Completion: **Monument** Northing (MGA): **6304423.705**  
 Hole Type: **Monitoring Well** Water Strike (m bgl): **-**

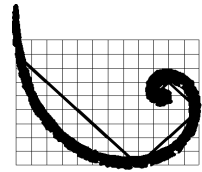
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
			25							
<b>Siltstone</b> Pale grey, very fine gravel, becoming dark grey at 26 m.			26							
<b>Sandstone</b> Grey, moist, medium to coarse gravel, sub-rounded to rounded.			27							
			28							
			29							
			30							End of hole at 30.0 m bgl, target depth achieved.
End of Log										

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **AA / TS**  
 Checked By: **A. Ashworth**  
 Page 5 of 5

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

**ID: ML\_MW23**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **14/10/2013** Total Depth (m): **0.3** Final Water Level (m bgl): -  
 Drill Finish Date: **14/10/2013** Hole Diam. / Width (mm): **200** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Scott Jessup** Casing Diam. (mm): - Easting (MGA): **223878**  
 Drill Method: **NDD** Surface Completion: **Backfill** Northing (MGA): **6304518**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Silty Clay</b> Black with weathered coal, dry, cobbles and coal fragments, 4-5 cm in diameter.			0		DS	Y			ML_MW23_0.1	
End of Log			0 1 2 3 4 5 6							End of hole at 0.3 m bgl, Underground service encountered.

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **A. Ashworth**  
 Checked By: **T. Shaw**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_MW24**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **16/10/2013** Total Depth (m): **0.45** Final Water Level (m bgl): -  
 Drill Finish Date: **16/10/2013** Hole Diam. / Width (mm): **300** Elevation (Ground): -  
 Drill Co: **Numac** Casing Type: **None** Elevation (Case): -  
 Driller: **Scott Jessup** Casing Diam. (mm): - Easting (MGA): **223603**  
 Drill Method: **NDD** Surface Completion: **Backfill** Northing (MGA): **6304383**  
 Hole Type: **Soil Bore** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Clayey Gravel</b> Black, dry, poorly sorted, no staining, no odour.					DS	Y		0	ML_MW24_0.2	End of hole at 0.45 m bgl, NDD refusal on shale.
<b>Clayey Gravel</b> Black, dry, cobbles to 150 mm diameter (30%), no staining, no odour.										
End of Log			1							
			2							
			3							
			4							
			5							
			6							

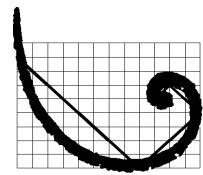
**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **A. Ashworth**

Checked By: **T. Shaw**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_SB22**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>27/11/2013</b>	Total Depth (m): <b>0.1</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>27/11/2013</b>	Hole Diam. / Width (mm): <b>300</b>	Elevation (Ground): -
Drill Co: <b>ERM</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Thavone Shaw</b>	Casing Diam. (mm): -	Easting (MGA): <b>223851</b>
Drill Method: <b>HA</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6304618</b>
Hole Type: <b>Surface Sample</b>	Water Strike (m bgl): -	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Clay</b> Pale brown with some gravel, rare fine angular gravels <5 mm (10%), loose, organic matter, no evidence of contamination.	////		0	■	DS	Y		1.1	ML_SB22_0.05	
End of Log			1							
			2							
			3							
			4							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

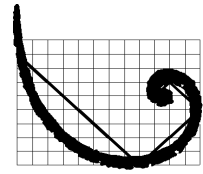
Log By: **T. Shaw**

Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_SB25**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>6/11/2013</b>	Total Depth (m): <b>0.1</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>6/11/2013</b>	Hole Diam. / Width (mm): <b>100</b>	Elevation (Ground): -
Drill Co: <b>ERM</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Charles Terhune</b>	Casing Diam. (mm): -	Easting (MGA): <b>223671</b>
Drill Method: <b>HA</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6304365</b>
Hole Type: <b>Surface Sample</b>	Water Strike (m bgl): -	

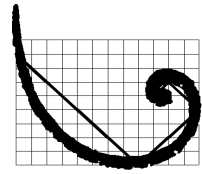
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Gravelly Sand</b> Brown, dry, loose, poorly sorted, fine to coarse, grained, sub-angular, to angular, intermixed, no evidence of contamination.			0		DS	Y		0	ML_SB25_0.05	
End of Log			1							
			2							
			3							
			4							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **C. Terhune**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_SB26**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>6/11/2013</b>	Total Depth (m): <b>0.1</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>6/11/2013</b>	Hole Diam. / Width (mm): <b>100</b>	Elevation (Ground): -
Drill Co: <b>ERM</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Charles Terhune</b>	Casing Diam. (mm): -	Easting (MGA): <b>223704</b>
Drill Method: <b>HA</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6304411</b>
Hole Type: <b>Surface Sample</b>	Water Strike (m bgl): -	

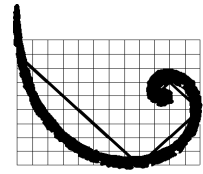
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Gravelly Sand</b> Brown, dry, loose, poorly sorted, fine to coarse, grained, sub-angular, to angular, intermixed, no evidence of contamination.			0		DS	Y		0	ML_SB26_0.05	
End of Log			1							
			2							
			3							
			4							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **C. Terhune**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_SB27**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>6/11/2013</b>	Total Depth (m): <b>0.1</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>6/11/2013</b>	Hole Diam. / Width (mm): <b>100</b>	Elevation (Ground): -
Drill Co: <b>ERM</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Charles Terhune</b>	Casing Diam. (mm): -	Easting (MGA): <b>223672</b>
Drill Method: <b>HA</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6304439</b>
Hole Type: <b>Surface Sample</b>	Water Strike (m bgl): -	

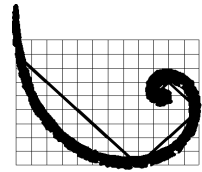
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Gravelly Sand</b> Brown, dry, loose, poorly sorted, fine to medium, grained, sub-angular, to angular, intermixed, no evidence of contamination.			0		DS	Y		0	ML_SB27_0.05	
End of Log			1							
			2							
			3							
			4							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **C. Terhune**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_SB28**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>6/11/2013</b>	Total Depth (m): <b>0.1</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>6/11/2013</b>	Hole Diam. / Width (mm): <b>100</b>	Elevation (Ground): -
Drill Co: <b>ERM</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Charles Terhune</b>	Casing Diam. (mm): -	Easting (MGA): <b>223744</b>
Drill Method: <b>HA</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6304462</b>
Hole Type: <b>Surface Sample</b>	Water Strike (m bgl): -	

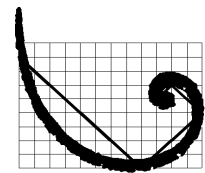
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Gravelly Sand</b> Brown, dry, loose, poorly sorted, fine to course, grained, sub-angular, to angular, intermixed, no evidence of contamination.			0		DS	Y		0	ML_SB28_0.05	
End of Log			1							
			2							
			3							
			4							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **C. Terhune**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_SB29**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>27/11/2013</b>	Total Depth (m): <b>0.15</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>27/11/2013</b>	Hole Diam. / Width (mm): <b>150</b>	Elevation (Ground): -
Drill Co: <b>ERM</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Thavone Shaw</b>	Casing Diam. (mm): -	Easting (MGA): <b>223763</b>
Drill Method: <b>HA</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6304427</b>
Hole Type: <b>Surface Sample</b>	Water Strike (m bgl): -	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Gravelly clay with some sand, brown, dry, fine to medium grained sands, angular, poorly sorted, gravels are angular below 50 mm diameter (40%), poorly sorted, no evidence of contamination.			0		DS	Y			ML_SB29_0.1	
End of Log			1							
			2							
			3							
			4							

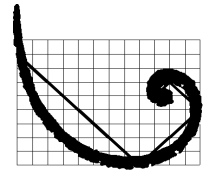
**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_SB30**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **26/11/2013** Total Depth (m): **0.15** Final Water Level (m bgl): -  
 Drill Finish Date: **26/11/2013** Hole Diam. / Width (mm): **150** Elevation (Ground): -  
 Drill Co: **ERM** Casing Type: **None** Elevation (Case): -  
 Driller: **Thavone Shaw** Casing Diam. (mm): - Easting (MGA): **223906**  
 Drill Method: **HA** Surface Completion: **Backfill** Northing (MGA): **6304445**  
 Hole Type: **Surface Sample** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Gravelly clay, dark brown, moist, fine <5mm, angular gravels (40%), poorly sorted, no evidence of contamination.			0		DS	Y			ML_SB30_0.1	
End of Log			1							
			2							
			3							
			4							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

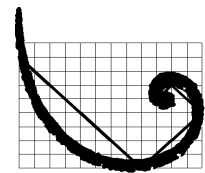
Log By: **T. Shaw**

Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_SB31**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **27/11/2013** Total Depth (m): **0.15** Final Water Level (m bgl): -  
 Drill Finish Date: **27/11/2013** Hole Diam. / Width (mm): **150** Elevation (Ground): -  
 Drill Co: **ERM** Casing Type: **None** Elevation (Case): -  
 Driller: **Thavone Shaw** Casing Diam. (mm): - Easting (MGA): **223822**  
 Drill Method: **HA** Surface Completion: **Backfill** Northing (MGA): **6304550**  
 Hole Type: **Surface Sample** Water Strike (m bgl): -

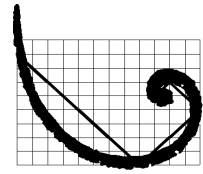
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Gravelly clay, brown, dry, loose, angular gravels, <50 mm, poorly sorted, roots/ rootlets, no evidence of contamination.			0		DS	Y		0.6	ML_SB31_0.1	
End of Log			1							
			2							
			3							
			4							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_SB32**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>26/11/2013</b>	Total Depth (m): <b>0.1</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>26/11/2013</b>	Hole Diam. / Width (mm): <b>150</b>	Elevation (Ground): -
Drill Co: <b>ERM</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Thavone Shaw</b>	Casing Diam. (mm): -	Easting (MGA): <b>223845</b>
Drill Method: <b>HA</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6304383</b>
Hole Type: <b>Surface Sample</b>	Water Strike (m bgl): -	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Gravelly clay, brown, dry, angular gravels <50 mm (50%), loose, poorly sorted, no evidence of contamination.			0		DS	Y		0.1	ML_SB32_0.05	
End of Log			1							
			2							
			3							
			4							

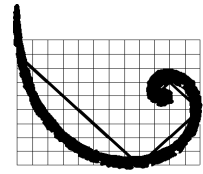
**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_SB34**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>27/11/2013</b>	Total Depth (m): <b>0.1</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>27/11/2013</b>	Hole Diam. / Width (mm): <b>150</b>	Elevation (Ground): -
Drill Co: <b>ERM</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Thavone Shaw</b>	Casing Diam. (mm): -	Easting (MGA): <b>223875</b>
Drill Method: <b>HA</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6304565</b>
Hole Type: <b>Surface Sample</b>	Water Strike (m bgl): -	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Gravelly clay, brown, dry, angular gravels <40 mm (40%), loose, poorly sorted, roots and rootlets, no evidence of contamination.			0		DS	Y		3.3	ML_SB34_0.05	
End of Log			1							
			2							
			3							
			4							

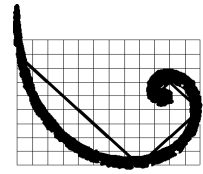
**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_SB35**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>6/11/2013</b>	Total Depth (m): <b>0.15</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>6/11/2013</b>	Hole Diam. / Width (mm): <b>100</b>	Elevation (Ground): -
Drill Co: <b>ERM</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Charles Terhune</b>	Casing Diam. (mm): -	Easting (MGA): <b>223711</b>
Drill Method: <b>HA</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6304600</b>
Hole Type: <b>Surface Sample</b>	Water Strike (m bgl): -	

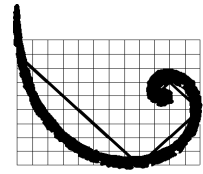
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Gravelly Sand</b> Brown, dry, loose, poorly sorted, fine to course grained, angular to sub-angular, intermixed, no evidence of impact.			0		DS	Y		0	ML_SB35_0.1	
End of Log			1							
			2							
			3							
			4							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **C. Terhune**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_SB36**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>6/11/2013</b>	Total Depth (m): <b>0.1</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>6/11/2013</b>	Hole Diam. / Width (mm): <b>100</b>	Elevation (Ground): -
Drill Co: <b>ERM</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Charles Terhune</b>	Casing Diam. (mm): -	Easting (MGA): <b>223626</b>
Drill Method: <b>HA</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6304499</b>
Hole Type: <b>Surface Sample</b>	Water Strike (m bgl): -	

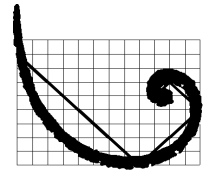
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Sand</b> Red, dry, loose, well sorted, fine grained, sub-angular, homogenous, no evidence of impact.			0		DS	Y		0	ML_SB36_0.05	
End of Log			1							
			2							
			3							
			4							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **C. Terhune**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_SB37**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>6/11/2013</b>	Total Depth (m): <b>0.1</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>6/11/2013</b>	Hole Diam. / Width (mm): <b>100</b>	Elevation (Ground): -
Drill Co: <b>ERM</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Charles Terhune</b>	Casing Diam. (mm): -	Easting (MGA): <b>223624</b>
Drill Method: <b>HA</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6304443</b>
Hole Type: <b>Surface Sample</b>	Water Strike (m bgl): -	

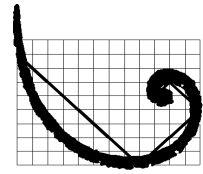
Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Gravelly Sand</b> Brown, dry, loose, poorly sorted, fine to course grained, angular to sub-angular, intermixed, no evidence of impact.			0		DS	Y		0	ML_SB37_0.05	
End of Log			1							
			2							
			3							
			4							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **C. Terhune**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_SB38**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>6/11/2013</b>	Total Depth (m): <b>0.1</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>6/11/2013</b>	Hole Diam. / Width (mm): <b>100</b>	Elevation (Ground): -
Drill Co: <b>ERM</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Charles Terhune</b>	Casing Diam. (mm): -	Easting (MGA): <b>226734</b>
Drill Method: <b>HA</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6304524</b>
Hole Type: <b>Surface Sample</b>	Water Strike (m bgl): -	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Gravelly Sand</b> Brown, dry, loose, poorly sorted, fine to course grained, angular to sub-angular, intermixed, no evidence of impact.			0		DS	Y			ML_SB38_0.05	
End of Log			1							
			2							
			3							
			4							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **C. Terhune**  
 Checked By: **A. Ashworth**



Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_SB39**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: **26/11/2013** Total Depth (m): **0.15** Final Water Level (m bgl): -  
 Drill Finish Date: **26/11/2013** Hole Diam. / Width (mm): **150** Elevation (Ground): -  
 Drill Co: **ERM** Casing Type: **None** Elevation (Case): -  
 Driller: **Thavone Shaw** Casing Diam. (mm): - Easting (MGA): **223820**  
 Drill Method: **HA** Surface Completion: **Backfill** Northing (MGA): **6304475**  
 Hole Type: **Surface Sample** Water Strike (m bgl): -

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Gravelly clay with some sand, brown, dry, loose, angular gravels, <30 mm, poorly sorted, no evidence of contamination, gravel coal on the surface.			0		DS	Y		0	ML_SB39_0.1	
End of Log			1							
			2							
			3							
			4							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**  
 Checked By: **A. Ashworth**

Client: **Delta Electricity**  
 Project No.: **0207423**  
 Project Name: **Project Symphony**  
 Site Name: **Mt Piper Power Station**  
 Site Address: **Lot 363 Boulder Rd, Blackmans Flat, NSW 2790**

ID: **ML\_SB40**



**ERM**

**ERM Australia Pty Ltd**

Drill Start Date: <b>26/11/2013</b>	Total Depth (m): <b>0.15</b>	Final Water Level (m bgl): -
Drill Finish Date: <b>26/11/2013</b>	Hole Diam. / Width (mm): <b>150</b>	Elevation (Ground): -
Drill Co: <b>ERM</b>	Casing Type: <b>None</b>	Elevation (Case): -
Driller: <b>Thavone Shaw</b>	Casing Diam. (mm): -	Easting (MGA): <b>223805</b>
Drill Method: <b>HA</b>	Surface Completion: <b>Backfill</b>	Northing (MGA): <b>6304348</b>
Hole Type: <b>Surface Sample</b>	Water Strike (m bgl): -	

Lithology	Symbol	Well	Depth (m)	Recovery	Sample Type	Analysed	PPT (kPa)	PID (ppm)	Sample Details	Remarks
Ground Surface			0							
<b>Fill</b> Sandy clay with some gravel, dry, dark brown, fine angular gravels, <10 mm, (20%), sands are sub angular, loose, organic matter (root and rootlets), no evidence of contamination, gravels include sandstone, shale and coal.			0		DS	Y		0	ML_SB40_0.1	
End of Log			1							
			2							
			3							
			4							

**NOTE:** This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Log By: **T. Shaw**

Checked By: **A. Ashworth**

Annex E

## Field Documentation



# Groundwater - Well Sampling Data Form

Job Information	
Date: 16.12.13	Time: arrive 13.15 depart
Project Name: Symphony	Project Number: 0207423
Site Location: Mt Piper	Sampler: T. Shaw
Well ID: MA-MW01	Weather: overcast

Equipment	
Water quality equipment description: VSI (101100323)	Interface probe number: Geotech
Purging equipment: (please circle)	Bailer type: Plastic Teflon Pump type: <u>Peristaltic</u> Submersible Micro-purge Amazon Other:

Well Gauging and Purge Volume Calculations									
Well Boring Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (to be in factor L/m)	0.98	<u>1.96</u>	7.85	31.4	49.1	70.7	125.7	196.3	
Total Well Depth (-) Water level (=) Water Column	5.500 m (-) 3.736 m (=) 1.764 m								
Water Column (x) Conversion Factor (=) Litres per 1 Well Volume	~1.8 m (x) ~2 (=) ~3.6 L								
Depth to product: _____ m	Product Thickness: _____ m	Verified with Bailer: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N							

Water Quality Parameters								
Beginning purge time:				Ending purge time:				
Litres	Time	PH	Temp °C	Cond µS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.2	13:40	6.67	27.2	35.8	4.69	41.2	-	slightly cloudy, no odour, pale brown.
0.65	13:43	6.40	24.1	3.5	5.68	56.1	-	
1.1	13:46	6.26	23.1	3.2	5.64	66.1	4.085	
1.55	13:49	6.25	23.1	3.0	6.38	65.8	4.152	
2.0	13:52	6.22	23.1	2.7	5.25	62.7	4.201	
2.45	13:55	6.15	23.5	3.5	5.02	-113.1	4.257	(old redox)
2.9	13:58	6.12	22.8	3.2	5.11	-72.0	4.340	
3.35	14:01	6.12	22.1	2.6	5.05	-85.0		
*pH, temp, cond readings not necessary if well is purged dry				Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth				

3.4 L	Total Well Volume Actual amount of water prior to sampling	Sample time 14:05	Containers used 6
150	Flow rate mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N

Field QC Checks	
Was pre-cleaning sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Rinsate blank collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
	Duplicate sample ID _____
	Rinsate blank ID _____



# Groundwater - Well Sampling Data Form

## Job Information

Date: 16/12/13	Time: arrive 09:30 depart 11:46
Project Name: Symphony	Project Number: 0207423
Site Location: Mt. Piper	Sampler: T. Shaw
Well ID: MA-MWC7	Weather: overcast.

## Equipment

Water quality equipment description: YSI (104100323)	Interface probe number: Geotech				
Purging equipment: (please circle)	Bailer type: Plastic	Teflon			
	Pump type: <u>Peristaltic</u>	Submersible	Micro-purge	Amazon	Other:

## Well Gauging and Purge Volume Calculations

Gauging Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (ie in factor L/m)	0.98	<u>1.96</u>	7.85	31.4	49.1	70.7	125.7	196.3	
Total Well Depth (-) Water level (=) Water Column	9.085 m (-) 7.692 m (=) <u>1.363</u> m								
Water Column (x) Conversion Factor (=) Litres per 1 Well Volume	<u>~1.4</u> m (x) <u>~2</u> (=) <u>2.8</u> L								
Depth to product: _____ m	Product Thickness: _____ m.	Verified with Bailer: <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N							

## Water Quality Parameters

Beginning purge time: 10:56		Ending purge time:		Water intake: 8.5m					
Litres	Time	PH	Temp °C	Cond µS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments	
10.57	10:58	7.76	29.1	39.4	5.36	-89.5	-	clear, colourless, no odour	
0.65	11:00	7.10	27.4	3.8	6.31	29.3	-	cloudy, pale brown	
1.1	11:03	6.78	26.4	3.5	6.96	-3.9	7.695		
1.55	11:06	6.59	22.4	3.0	8.95	-1.1	7.697	(Redox fluctuating quite a bit -4 → +14)	
2.0	11:09	6.57	22.5	2.4	8.50	-3.3			
2.6	11:13	6.51	22.3	1.2	7.81	-26.1			
2.9	11:15	6.45	22.1	0.3	7.62	-28.8			
3.35	11:18	6.41	22.4	0.2	7.03	68.7			
*pH, temp, cond readings not necessary if well is purged dry								Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth	

<del>3.4</del> 3.4	Total Well Volume	Sample time 11:20	Containers used 6+5+6
150	Actual amount of water prior to sampling	Flow rate mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
			Was the well dry purged? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N

## Field QC Checks

Was pre-cleaning sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	* Duplicate did not get sampled for femus iron
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA	
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N <input type="checkbox"/> NA	
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA	
Duplicate sample collected?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	
Rinsate blank collected?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	Duplicate sample ID <u>TO1-161213-T5</u>
			Rinsate blank ID _____



# Groundwater - Well Sampling Data Form

Job Information	
Date: 16.12.13	Time: arrive 14.20 depart 15.15
Project Name: Symphony	Project Number: 0207423
Site Location: MF Piper.	Sampler: T. Shaw
Well ID: MA-MW12	Weather: fine.

Equipment	
Water quality equipment description: YSI (10+100322)	Interface probe number:
Purging equipment: (please circle)	Bailer type: Plastic Teflon Pump type: Peristaltic Submersible Micro-purge Amazon Other:

Well Gauging and Purge Volume Calculations									
casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3,14159 r = radius in cm h = height of water column in cm
Conversion Factor (see in factor L/m)	0.98	(1.96)	7.85	31.4	49.1	70.7	125.7	196.3	
Total Well Depth (-) Water level (=) Water Column 5.741 m (-) 4.457 m (=) 1.284 m Water Column (x) Conversion Factor (=) Litres per 1 Well Volume ~1.3 m (x) ~2 (=) ~2.6 L									
Depth to product: _____ m      Product Thickness: _____ m      Verified with Bailer: <input type="checkbox"/> Y <input type="checkbox"/> N									

Water Quality Parameters								Comments
Litres	Time	PH	Temp °C	Cond µS/cm	DO mg/L	Redox mV	Drawdown <10cm	
Beginning purge time: 14.37			Ending purge time: 14.46			intake: 5.2m		
0.2	14.48	6.20	16.9	465.5	0.98	-71.1	4.463	slightly cloudy, no odour
0.65	14.51	6.04	16.3	542.8	0.44	-47.6	4.458	
1.1	14.54	6.03	16.2	456.1	0.34	-51.8	4.458	
1.55	14.57	6.12	16.1	447.9	0.26	-49.0	4.460	
2.0	15.00	6.08	16.1	449.0	0.21	-45.3	4.460	
*pH, temp, cond readings not necessary if well is purged dry								Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

2 L	Total Well Volume	Sample time 15.00	Containers used 6
150	Actual amount of water prior to sampling	Flow rate mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
			Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N

Field QC Checks	
Was pre-cleaning sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Rinsate blank collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
	Duplicate sample ID _____
	Rinsate blank ID _____



# Groundwater - Well Sampling Data Form

Job Information	
Date: <u>6/11/13</u>	Time: arrive <u>08:50</u> depart <u>09:30</u>
Project Name: <u>Symphony stage 2</u>	Project Number: <u>0207423</u>
Site Location: <u>mt. Piper</u>	Sampler: <u>D. Brookes + S. Holliman</u>
Well ID: <u>MA-X-5/D11</u>	Weather: <u>Fine.</u>

Equipment	
Water quality equipment description: <u>YSI</u>	Interface probe number: <u>SYD 3984 60M</u>
Purging equipment: (please circle)	Bailer type: <u>Plastic</u> Teflon
	Pump type: <u>Peristaltic</u> Submersible <u>Micro-purge</u> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth (-) Water level (=) Water Column	<u>12.424</u> m (-) <u>7.365</u> m (=) <u>5.159</u> m								
	Water Column		(x) Conversion Factor (=) Litres per 1 Well Volume						
	<u>5.159</u> m (x) <u>1.96</u>		=) <u>10.318</u> L						
Depth to product: _____ m	Product Thickness: _____ m		Verified with Bailer: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N						

Water Quality Parameters								
Beginning purge time: <u>09:00</u>		Ending purge time: <u>09:22</u>			Pump Intake Depth (mbtoc): <u>11.924</u>			
Litres	Time	PH	Temp °C	Cond $\mu$ S/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.2	09:02	6.30	15.9	559	4.27	44.9	7.365	slightly cloudy, brown, no odour
1.0	09:06	6.16	16.1	593	0.82	35.6	7.365	" " "
1.8	09:10	6.13	15.9	577	0.83	38.3	7.367	clear, yellow, no odour
3.0	09:14	6.11	16.0	570	0.41	40.5	7.367	" " "
4.0	09:18	6.09	16.0	567	0.44	41.4	7.367	" " "
5.0	09:22	6.09	16.0	564	0.39	44.4	7.367	" " "

\*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

<u>10.318</u>	Total Well Volume Actual amount of water prior to sampling	Sample time <u>09:23</u>	Containers used <u>6</u>
<u>200</u>	Flow rate mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Rinsate blank collected?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N

Metals, TRH, BTEX, PAH, Phands, Voc Suite, PCB, cations / anions

Duplicate sample ID \_\_\_\_\_

Rinsate blank ID \_\_\_\_\_



MA-X-MW15



# Groundwater - Well Sampling Data Form

Job Information	
Date: 5/11/13	Time: arrive 15:30 depart 16:35
Project Name: Symphony Stage 2	Project Number: 0207423
Site Location: Mt. Piper	Sampler: S. Holloman + J. Brookes
Well ID: TE MW15	Weather: Fine.

Equipment	
Water quality equipment description: Ys1	Interface probe number: SYD 398460M
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible <b>Micro-purge</b> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V $= Pr \times r \times h$ V = volume in litres $P = 3.14159$ r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
5.938 m	(-) 3.035 m	(=) 2.903 m							
			Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume				
			2.903 m	(x) 1.96	(=) 5.806 L				
Depth to product: — m		Product Thickness: — m		Verified with Bailer: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N					

Water Quality Parameters								
Beginning purge time: 16:00			Ending purge time: 16:26			Pump Intake Depth (mbtot): 5.438		
Litres	Time	PH	Temp °C	Cond $\mu$ S/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.2	16:02	6.38	17.7	661	1.21	-30.5	3.225	turbid, brown, no odour
1.0	16:06	6.35	15.1	792	0.53	-54.2	3.635	" " "
1.8	16:10	6.34	16.6	786	0.44	-59.6	3.735	Slightly cloudy, brown, no odour
2.6	16:14	6.34	16.4	779	0.30	-64.6	3.970	clear, brown, no odour
3.4	16:18	6.34	16.7	651	0.29	-70.3	4.080	" " "
4.2	16:22	6.34	16.2	644	0.30	-78.7	4.225	" " "
5.0	16:26	6.35	16.2	643	0.32	-82.2	4.372	" " "
								drawdown > 10cm on lowest $\rightarrow$ pump flow

\*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

5.806	Total Well Volume	Actual amount of water prior to sampling	Sample time	16:27	Containers used	12
200.	Flow rate	mL/minute	Did field parameters stabilise?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Rinsate blank collected?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Duplicate sample ID: —	
Rinsate blank ID: RB-GW/6-051113	



# Groundwater - Well Sampling Data Form

Job Information	
Date: 5/11/13	Time: arrive 15:00 depart 15:35
Project Name: Symphony stage 2	Project Number: 0207423
Site Location: Mt. Piper	Sampler: S. Holloman + D. Brookes
Well ID: TE-mw16	Weather: Fine

Equipment	
Water quality equipment description: YSI	Interface probe number: SYD 3984 60m
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible <b>Micro-purge</b> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
5.481 m	(-) 2.682 m	(=) 2.799 m							
			Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume				
			2.799 m	(x) 1.96	(=) 5.598 L				
Depth to product: — m		Product Thickness: — m		Verified with Bailer: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N					

Water Quality Parameters								
Beginning purge time: 15:09			Ending purge time: 15:25			Pump Intake Depth (mbide): 4.981		
Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.2	15:10	6.15	15.4	410.3	2.41	44.1	2.873	Clear, very light brown, no odour.
0.8	15:13	5.91	15.3	398.6	0.94	49.9	3.138	↓
1.4	15:16	5.84	16.3	402.7	1.11	54.3	3.219	
2.0	15:19	5.82	16.4	410.9	1.07	55.6	3.298	Clear, colourless, no odour.
2.6	15:22	5.82	16.3	422.7	1.09	56.0	3.360	↓
3.2	15:25	5.83	16.2	434.7	0.94	54.7	3.420	

\*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

5.598	Total Well Volume Actual amount of water prior to sampling	Sample time 15:26	Containers used 16
200.	Flow rate mL/minute	Did field parameters stabilise: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Rinsate blank collected?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N

Duplicate sample ID D03-GW-051113

Rinsate blank ID



# Groundwater - Well Sampling Data Form

Job Information	
Date: 18.12.13	Time: arrive 1310 depart 1415
Project Name: Phase II ESA - Mt Piper	Project Number: 0207423
Site Location: Mt Piper	Sampler: C. Ford
Well ID: MB_MW02	Weather: Fine

Equipment	
Water quality equipment description: YSI Pro Plus	Interface probe number: Armet 23973
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible <u>Micro-purge</u> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V $V = Pr \times r \times h$ V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
13.466 m	(-) 12.03 m	(=) 1.436 m	Mbg1						
	Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume						
	1.436 m	(x) 1.96	(=) 2.815 L						
Depth to product: - m	Product Thickness: - m	Verified with Bailer: <input type="checkbox"/> Y <input checked="" type="checkbox"/> N							

Water Quality Parameters									
Beginning purge time: 1327		Ending purge time: 1406			Pump Intake Depth (mbtoc): 12.5				
Litres	Time	PH	Temp °C	Cond $\mu$ S/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments	
0.1	1334	6.27	21.8	602	0.39	40.0	12.04	very turbid, no odour or screen	
0.5	1340	5.87	21.0	606	0.34	51.8	12.05	Same as above	
1.0	1346	5.84	19.4	463.4	0.73	51.9	12.05	Same as above	
1.5	1352	5.84	18.8	427.1	0.97	52.3	12.05	Same as above	
2.0	1356	5.83	18.4	415.9	0.45	52.6	12.06	Same as above	
2.5	1359	5.82	18.5	413.2	0.31	52.0	12.05	Same as above	
3.0	1402	5.82	18.5	410.0	0.31	52.0	12.05	Same as above	
3.5	1406	5.82	18.8	413.4	0.31	51.9	12.06	Same as above	
*pH, temp, cond readings not necessary if well is purged dry				Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth					
3.5	Total Well Volume		Actual amount of water prior to sampling		Sample time: 1406		Containers used: 7		
100	Flow rate mL/minute		Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA		Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N				

Field QC Checks		
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N
Rinsate blank collected?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N
Duplicate sample ID: _____		_____
Rinsate blank ID: _____		_____

well gauged from ~~surveying~~ ~~the~~ gauged from ground level needs to be adjusted for with surveying





# Groundwater - Well Sampling Data Form

## Job Information

Date: 18.12.13	Time: arrive 0955	depart 1053
Project Name: Phase II ESA - Mt Piper	Project Number: 0207423	
Site Location: Mt Piper Power Plant	Sampler: C. Ford	
Well ID: MB- <del>1003</del> MW03	Weather: Fine	

## Equipment

Water quality equipment description: YSE Pro Plus	Interface probe number: Armet 23973
Purging equipment: (please circle)	Bailer type: Plastic Teflon
Pump type: Peristaltic Submersible <u>Micro-purge</u> Amazon Other:	

## Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	<u>50mm</u>	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth (-) Water level (=) Water Column	7.695 m (-) 4.020 m	(=) 3.675 m	mbgl						
Water Column (x) Conversion Factor (=) Litres per 1 Well Volume	3.675 m (x) 1.96	(=) 7.203 L							
Depth to product: - m	Product Thickness: - m	Verified with Bailer: <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N							

## Water Quality Parameters

Beginning purge time: 1002	Ending purge time:	Pump Intake Depth (mbtoc): 6.						
Litres	Time	PH	Temp °C	Cond µS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.1	1005	5.29	22.0	439.1	0.15	135.0	4.030	Turbid, no odour or skin
0.5	1009	5.09	19.9	426.1	0.13	148.3	4.060	Same as above
1.0	1013	5.07	19.1	417.2	0.14	149.1	4.081	Same as above
1.5	1017	5.11	18.1	409.7	0.39	147.2	4.085	Same as above
2.0	1021	5.13	18.1	409.2	1.71	144.3	4.082	Same as above
2.5	1026	5.06	18.2	408.2	1.56	155.4	4.085	Same as above
3.0	1030	5.04	18.3	407.1	0.77	157.2	4.086	Same as above
3.5	1033	5.03	17.9	405.1	0.62	157.5	4.083	Same as above
4.0	1036	5.03	18.3	406.0	0.45	157.6	4.084	cloudy, no odor or skin
4.5	1039	5.03	18.1	404.2	0.56	156.2	4.081	Same as above
*pH, temp, cond readings not necessary if well is purged dry				Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth				
4.5	Total Well Volume	Actual amount of water prior to sampling		Sample time 1039		Containers used 7		
125	Flow rate mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA		Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N				

## Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Fill Gas
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Discharge: 10s
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA	
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	Duplicate sample ID -
Rinsate blank collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	Rinsate blank ID -

Groundwater - well sampling data form v1.0

Well gauged at ground level needs to be adjusted for with surveys



# Groundwater - Well Sampling Data Form

Job Information	
Date: <u>19.12.13</u>	Time: arrive <u>11.15</u> depart <u>12.15</u>
Project Name: <u>Symphony</u>	Project Number: <u>0207423</u>
Site Location: <u>Mt Piper</u>	Sampler: <u>T. Shaw</u>
Well ID: <u>MB-MW04</u>	Weather: <u>fine</u>

Equipment	
Water quality equipment description: <u>YSI (10+100323)</u>	Interface probe number:
Purging equipment: (please circle)	Bailer type: <u>Plastic</u> Teflon
	Pump type: <u>Peristaltic</u> Submersible Micro-purge Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	<u>1.98</u>	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
<u>8.224</u> m	(-) <u>2.415</u> m	(=) <u>5.709</u> m							
	Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume						
	<u>~5.7</u> m	(x) <u>~2</u>	(=) <u>11.4</u> L						
Depth to product: _____ m	Product Thickness: _____ m	Verified with Bailer: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N							

Water Quality Parameters								
Beginning purge time: <u>11.21</u>			Ending purge time:				Pump Intake Depth (mbtoc): <u>~7.7</u>	
Litres	Time	PH	Temp °C	Cond µS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.2	11.24	6.22	22.5	740	0.21	6.1	2.533	cloudy, pale brown, no odour.
0.56	11.27	6.18	21.7	247	0.33	-9.8	2.585	
0.92	11.30	6.20	21.6	743	0.46	-12.1	2.631	
1.28	11.33	6.25	20.6	725	0.41	-13.0	2.666	
1.64	11.36	6.29	20.2	715	0.38	-12.4	2.690	slowed flow rate.
2.0	11.39	6.55	20.8	713	0.31	-12.7	2.693	
2.3	11.42	6.60	20.9	724	0.31	-13.5	2.700	
2.6	11.45	6.62	21.1	732	0.31	-14.5	2.707	
2.9	11.48	6.53	21.4	796	0.31	-15.3	2.718	
3.2	11.51	6.44	21.4	739	0.28	-14.8	2.725	
*pH, temp, cond readings not necessary if well is purged dry				Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth				
<u>3.8L</u>	Total Well Volume Actual amount of water prior to sampling			Sample time <u>12.00</u>		Containers used <u>6</u>		
<u>120/100</u>	Flow rate mL/minute			Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA		Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N		

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Rinsate blank collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Duplicate sample ID	_____
Rinsate blank ID	_____

3.5 11.54 6.52 20.3 725 0.30 -13.5 2.738  
 3.8 11.57 6.51 20.2 718 0.29 -12.9 2.718





# Groundwater - Well Sampling Data Form

Job Information	
Date: 18.12.13	Time: arrive 1545 depart 1645
Project Name: Phase II ESA - Mt Piper	Project Number: 0207423
Site Location: Mt Piper	Sampler: C. Ford
Well ID: MB-MW05	Weather: Fine

Equipment	
Water quality equipment description: YSI PRO PLUS	Interface probe number: AIRMET 23973
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible <u>Micro-purge</u> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = $\pi r^2 h$ V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
7.932 m	(-) 6.575 m	(=) 1.357 m	mbg1						
	Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume						
	1.357 m	(x) 1.96	(=) 2.659 L						
Depth to product:	~ m	Product Thickness:	~ m	Verified with Bailer:		Y <input checked="" type="radio"/> N			

Water Quality Parameters								
Beginning purge time: 1601			Ending purge time: 1630			Pump Intake Depth (mbtoc): 7.00		
Litres	Time	PH	Temp °C	Cond $\mu$ S/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.1	1604	5.29	23.6	3.5	0.23	31.1	6.691	Cloudy, no odour, no stream
0.5	1606	5.45	23.7	11.5	2.02	9.5	6.721	Same as above
1.0	1612	5.40	18.3	602	0.45	62.1	6.742	Same as above
1.5	1618	5.13	18.2	550	0.20	122.1	6.812	Same as above
2.0	1622	5.11	17.8	545	0.37	129.7	6.822	Same as above
2.5	1626	5.14	18.0	547	0.25	130.2	6.814	Same as above
3.0	1630	5.13	18.0	544	0.22	138.1	6.813	clear, no odour or stream
*pH, temp, cond readings not necessary if well is purged dry						Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth		
3.0	Total Well Volume		Actual amount of water prior to sampling		Sample time: 1630		Containers used: 7	
125	Flow rate		mL/minute		Did field parameters stabilise? <input checked="" type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA		Was the well dry purged? <input type="radio"/> Y <input checked="" type="radio"/> N	

Field QC Checks		
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="radio"/> Y	<input type="radio"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="radio"/> Y	<input type="radio"/> N
Was documentation of equipment conducted?	<input checked="" type="radio"/> Y	<input type="radio"/> N <input type="radio"/> NA
Were air bubbles present in vials at time of collection?	<input type="radio"/> Y	<input checked="" type="radio"/> N <input type="radio"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="radio"/> Y	<input type="radio"/> N <input type="radio"/> NA
Duplicate sample collected?	<input type="radio"/> Y	<input checked="" type="radio"/> N
Rinsate blank collected?	<input type="radio"/> Y	<input checked="" type="radio"/> N
Duplicate sample ID		_____
Rinsate blank ID		_____

*Well gauged from ground level, needs to be adjusted for with sunwain data*



# Groundwater - Well Sampling Data Form

## Job Information

Date: 16.12.13	Time: arrive 1530 depart 16.10
Project Name: Symphony	Project Number: 0207423
Site Location: Mt Piper	Sampler: T. Shaw
Well ID: MC-MWC1	Weather: overca

## Equipment

Water quality equipment description: ISI (10H100323)	Interface probe number: Geotech
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: <u>Peristaltic</u> Submersible Micro-purge Amazon Other:

## Well Gauging and Purge Volume Calculations

Gauging Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (see in factor L/m)	0.98	<u>(1.96)</u>	7.85	31.4	49.1	70.7	125.7	196.3	

Total Well Depth (-) Water level (=) Water Column  
5.376 m (-) 1.220 m (=) 4.150 m

Water Column (x) Conversion Factor (=) Litres per 1 Well Volume  
~ 4.2 m (x) ~ 2 (=) 8.4 L

Depth to product: \_\_\_\_\_ m Product Thickness: \_\_\_\_\_ m Verified with Bailer:  Y  N

## Water Quality Parameters

Beginning purge time:		Ending purge time:		intake ~ : 4.8					
Litres	Time	PH	Temp °C	Cond µS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments	
0.2	15:32	6.28	18.5	469.5	4.59	-14.0	1.402	clear, colourless, no odour	
0.7	15:35	6.36	17.8	456.9	0.38	-21.5	1.580	(slow pump rate)	
1.1	15:39	6.38	18.1	456.9	0.24	-23.9	1.737		
1.4	15:42	6.39	18.1	454.5	0.18	-25.9	1.842		
1.7	15:45	6.39	18.0	452.8	0.15	-27.3	1.960		
2.0	15:48	6.39	18.6	452.6	0.13	-28.2	2.066		

\*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

2L	Total Well Volume Actual amount of water prior to sampling	Sample time 15:50	Containers used 6
100	Flow rate mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N

## Field QC Checks

Was pre-cleaning sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Rinsate blank collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N

Duplicate sample ID \_\_\_\_\_  
Rinsate blank ID \_\_\_\_\_







# Groundwater - Well Sampling Data Form

## Job Information

Date: 17.12.13	Time: arrive 08.00 depart 08.45
Project Name: Symphony	Project Number: 0207423
Site Location: Mt Piper	Sampler: T-Shaw
Well ID: MC-MW03	Weather: fine

## Equipment

Water quality equipment description: YSI (104100323)	Interface probe number:
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible Micro-purge Amazon Other:

## Well Gauging and Purge Volume Calculations

Gauging Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (see in factor L/m)	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3	
Total Well Depth (-) Water level (=) Water Column 5.043 m (-) 2.755 m (=) 2.288 m									
Water Column (x) Conversion Factor (=) Litres per 1 Well Volume ~2.3 m (x) ~2 (=) ~4.6 L									
Depth to product: _____ m Product Thickness: _____ m Verified with Bailer: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N									

## Water Quality Parameters

Beginning purge time: 08:11				Ending purge time:				Comments			
Litres	Time	PH	Temp °C	Cond µS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments			
0.2	08:12	7.21	18.8	871	2.56	-359	2.808	brown			
0.65	08:15	6.49	18.0	857	0.82	-188	—	slightly cloudy, no odour.			
1.1	08:18	6.41	18.1	859	0.46	-193	2.915				
1.55	08:21	6.38	18.2	862	0.38	-206	2.944	(slowed flow rate to 125ml/min)			
2.0	08:24	6.38	18.2	859	0.31	-210	2.980				
2.5	08:27	6.36	18.1	855	0.29	-205		cloudy brown			
*pH, temp, cond readings not necessary if well is purged dry								Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth			

2.5	Total Well Volume Actual amount of water prior to sampling	Sample time 08:29	Containers used 6
150	Flow rate mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N

## Field QC Checks

Was pre-cleaning sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	* ferrous iron sampled in plastic unpreserved (field-filtered).
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA	
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	
Rinsate blank collected?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Duplicate sample ID _____ Rinsate blank ID _____

ROI-1612 B JS



# Groundwater - Well Sampling Data Form

## Job Information

Date: 17.12.13	Time: arrive 09:00 depart
Project Name: Symphony	Project Number: 0207423
Site Location: Mt Piper	Sampler: T. Snow
Well ID: MC-MW04	Weather: fine

## Equipment

Water quality equipment description: YSI (104100323)	Interface probe number: Geotech.
Purging equipment: (please circle)	Bailer type: Plastic Teflon
Pump type: Peristaltic	Submersible Micro-purge Amazon Other:

## Well Gauging and Purge Volume Calculations

Gauging Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm	
Conversion Factor (see in factor L/m)	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3		
Total Well Depth (-) Water level (=) Water Column	6.263 m (-) 2.941 m (=) 3.321 m									
Water Column (x) Conversion Factor (=) Litres per 1 Well Volume	3.3 m (x) 2 (=) 6.6 L									
Depth to product: _____ m	Product Thickness: _____ m	Verified with Bailer: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N								

## Water Quality Parameters

Beginning purge time: 09:07		Ending purge time:						
Litres	Time	PH	Temp °C	Cond µS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.2	09:09	6.64	20.6	690	1.86	-3.1	2.947	slightly cloudy, no odour
0.65	09:12	6.28	20.6	683	0.39	-1.7	2.952	
1.1	09:15	6.25	20.5	679	0.26	-2.9	2.955	
1.55	09:18	6.27	20.5	680	0.20	-4.4	2.957	
2.0	09:21	6.25	20.5	680	0.16	-5.7	2.960	
2.45	09:24	6.24	20.4	682	0.16	-6.8	2.963	
2.75	09:26	6.24	20.3	680	0.18	-7.1	2.963	clear + colourless
*pH, temp, cond readings not necessary if well is purged dry								Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

2.8 L	Total Well Volume Actual amount of water prior to sampling	Sample time 09:27	Containers used 6
150	Flow rate mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N

## Field QC Checks

Was pre-cleaning sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	* ferrous iron sampled in unpreserved plastic - field filtered
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA	
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	Duplicate sample ID _____
Rinsate blank collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	Rinsate blank ID _____



# Groundwater - Well Sampling Data Form

## Job Information

Date: 17.12.13	Time: arrive 10.00 depart 10.55
Project Name: Symphony	Project Number: 0207423
Site Location: Mt Piper	Sampler: T. Shaw
Well ID: MD-MW01	Weather: fine

## Equipment

Water quality equipment description: 151 (104100323)	Interface probe number: Geotech
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible Micro-purge Amazon Other:

## Well Gauging and Purge Volume Calculations

Drilling Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (see in factor L/m)	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3	
Total Well Depth (-) Water level (=) Water Column	6.975 m (-) 3.241 m (=) 3.734 m								
Water Column (x) Conversion Factor (=) Litres per 1 Well Volume	~ 3.7 m (x) ~ 2 (=) ~ 7.4 L								
Depth to product: _____ m	Product Thickness: _____ m	Verified with Bailer: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N							

## Water Quality Parameters

Beginning purge time: 10.16		Ending purge time:						Comments
Litres	Time	PH	Temp °C	Cond µS/cm	DO mg/L	Redox mV	Drawdown <10cm	
0.2	10.17	6.50	17.6	414.1	1.64	-9.4	3.261	slightly cloudy + brown, no odour
0.8	10.21	6.30	17.5	409.5	0.44	-27.3	3.266	
1.25	10.24	6.29	17.4	407.2	0.28	-31.2	3.270	(pump stopped)
1.7	10.28	6.36	17.1	403.8	0.28	-34.3		
1.15	10.31	6.35	17.3	424.4	0.17	-38.4	3.279	
1.6	10.34	6.36	17.3	427.3	0.14	-41.8	3.280	clear and colourless
2.05	10.37	6.38	17.1	431.1	0.14	-45.6	3.284	

\*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

2L	Total Well Volume	Sample time 10:40	Containers used 6
150	Actual amount of water prior to sampling	Flow rate mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
			Was the well dry purged? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N

## Field QC Checks

Was pre-cleaning sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	famous iron collected in unpreserved plastic field filtered
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA	
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	Duplicate sample ID _____
Rinsate blank collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	Rinsate blank ID _____



# Groundwater - Well Sampling Data Form

## Job Information

Date: 17.12.13	Time: arrive 11:20 depart 12:30
Project Name: Symphony	Project Number: 0207423
Site Location: Mt Piper	Sampler: T. Shaw
Well ID: MD-MW03	Weather: fine

## Equipment

Water quality equipment description: YSI (104100323)		Interface probe number:
Purging equipment: (please circle)	Bailer type: Plastic	Teflon
	Pump type: Peristaltic	Submersible    Micro-purge    Amazon    Other:

## Well Gauging and Purge Volume Calculations

casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (= In factor L/m)	0.98	(1.96)	7.85	31.4	49.1	70.7	125.7	196.3	
Total Well Depth (-) Water level (=) Water Column 3.984 m (-) 1.775 m (=) 2.209 m									
Water Column (x) Conversion Factor (=) Litres per 1 Well Volume ~2.2 m (x) ~2 (=) ~4.4 L									
Depth to product: _____ m		Product Thickness: _____ m		Verified with Bailer: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N					

## Water Quality Parameters

Beginning purge time: 11:36		Ending purge time:							Comments
Litres	Time	PH	Temp °C	Cond µS/cm	DO mg/L	Redox mV	Drawdown <10cm		
		<del>6.52</del>	<del>21.5</del>						
0.2	11:37	5.19	21.1	994.8	1.11	139.6	1.837	clear, colourless, no odour flow ~20cm/min. Slow	
0.8	11:40	5.07	21.3	989	0.54	146.9	1.902		
1.16	11:43	5.05	21.7	996	0.66	149.7	1.969		
1.52	11:46	5.01	21.6	988	0.85	154.2	2.018		
1.85	11:50	5.06	21.9	987	0.91	157.6	2.085		
2.36	11:53	5.06	22.0	970	0.92	156.0	2.132		

\*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

2.4 L	Total Well Volume Actual amount of water prior to sampling	Sample time 11:55	Containers used 6+5+6
120	Flow rate mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N

## Field QC Checks

Was pre-cleaning sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	* no ferrous iron for Dup Waste & primary ferrous iron sampled in unpreserved plastic 001-171213-JS 701-171213-JS
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA	
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	
Duplicate sample collected?	<input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N	
Rinsate blank collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	Duplicate sample ID _____ Rinsate blank ID _____



# Groundwater - Well Sampling Data Form

Job Information	
Date: 17.12.13	Time: arrive 13.40 depart 14.30
Project Name: Symphony	Project Number: 0207423
Site Location: Mt Piper	Sampler: J. Shaw
Well ID: MD-MW04	Weather: fine

Equipment	
Water quality equipment description: YSI (104100323)	Interface probe number: Geotech.
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible Micro-purge Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Total Well Depth	(-) Water level	(=) Water Column							
5.722 m	(-) 2.515 m	(=) 3.207 m							
			Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume				
			~ 3.2 m	(x) ~ 2	(=) ~ 6.4				
Depth to product: — m		Product Thickness: — m		Verified with Bailer: <input type="checkbox"/> Y <input checked="" type="checkbox"/> N					

Water Quality Parameters								
Beginning purge time: <del>13.44</del> 13.55			Ending purge time:				Pump Intake Depth (mbtoc):	
Litres	Time	PH	Temp °C	Cond µS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.2	13.58	6.62	21.7	347.2 <sub>µS</sub>	27.3	11.4	2.522	slightly cloudy, brown, no odour
0.725	13.59	6.86	21.1	332.8	0.48	-9.4	2.523	very very light oily <sup>100% no</sup> filter
1.25	14.02	6.95	20.8	327.0	0.35	-11.6	2.525	
1.775	14.05	7.08	20.8	327.1	0.22	-6.7	2.525	
2.30	14.08	7.01	20.3	324.2	0.18	-4.0	2.525	
2.825	14.11	7.03	20.5	326.3	0.15	-2.5	2.525	
3.350	14.14	6.98	20.4	325.7	0.13	-0.8	2.525	

\*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

3.42	Total Well Volume Actual amount of water prior to sampling	Sample time 14.15	Containers used 6
175	Flow rate mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N

Field QC Checks		
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N
Rinsate blank collected?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N
Duplicate sample ID		_____
Rinsate blank ID		_____





# Groundwater - Well Sampling Data Form

Job Information	
Date: <u>19/12/13</u>	Time: arrive <u>1005</u> depart <u>1130</u>
Project Name: <u>Symphon</u>	Project Number: <u>0207423</u>
Site Location: <u>Mt Piper</u>	Sampler: <u>SI</u>
Well ID: <u>ME-MW01</u>	Weather: <u>Fin</u>

Equipment	
Water quality equipment description:	Interface probe number:
Purging equipment: (please circle)	Bailer type: <b>Plastic</b> <b>Teflon</b>
	Pump type: <b>Peristaltic</b> <b>Submersible</b> <b>Micro-purge</b> <b>Amazon</b> <b>Other:</b>

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	<u>50mm</u>	100mm	125mm	150mm	200mm	250mm	300mm	<b>Volume of water in well / V</b> $V = Pr \times r \times h$ V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	<u>1.96</u>	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
<u>6.040</u> m	(-) <u>5.650</u> m	(=) <u>0.390</u> m							
	Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume						
	<u>0.390</u> m	(x) <u>1.96</u>	(=) <u>0.764</u> L						
Depth to product: <u>-</u> m	Product Thickness: <u>-</u> m	Verified with Bailer: <input type="checkbox"/> Y <input checked="" type="checkbox"/> N							

Water Quality Parameters								
Beginning purge time: <u>1030</u>			Ending purge time: <u>1105</u>			Pump Intake Depth (mbtoc): <u>5.80mbtoc</u>		
Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
<u>1.0</u>	<u>1032</u>	<u>6.75</u>	<u>19.0</u>	<u>1112</u>	<u>1.58</u>	<u>22.7</u>	-	<u>Greyish brown, med turb, no odour</u>
<u>1.60</u>	<u>1045</u>	<u>6.62</u>	<u>22.5</u>	<u>1159</u>	<u>1.93</u>	<u>10.2</u>	-	"
<u>2.60</u>	<u>1048</u>	<u>6.59</u>	<u>18.9</u>	<u>1011</u>	<u>1.47</u>	<u>11.9</u>	-	<u>" low turb</u>
<u>3.6</u>	<u>1050</u>	<u>6.58</u>	<u>17.6</u>	<u>946</u>	<u>1.58</u>	<u>12.7</u>	-	<u>clear water</u>
<u>4.6</u>	<u>1053</u>	<u>6.55</u>	<u>18.2</u>	<u>960</u>	<u>1.80</u>	<u>9.5</u>	-	"
<u>5.6</u>	<u>1100</u>	<u>6.58</u>	<u>17.9</u>	<u>952</u>	<u>1.66</u>	<u>7.8</u>	-	"
<u>6.6</u>	<u>1105</u>	<u>6.56</u>	<u>17.5</u>	<u>933</u>	<u>1.56</u>	<u>4.4</u>	-	"

\*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

<u>6.6L</u>	<b>Total Well Volume</b> Actual amount of water prior to sampling	Sample time <u>1115</u>	Containers used <u>6</u>
<u>180</u>	<b>Flow rate</b> mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Rinsate blank collected?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample ID	<u>-</u>
Rinsate blank ID	<u>-</u>

Fill time: 105  
 Batch time: 105





# Groundwater - Well Sampling Data Form

Job Information	
Date: <u>12/12/13</u>	Time: arrive <u>1135</u> depart <u>1230</u>
Project Name: <u>Symphon</u>	Project Number: <u>0207423</u>
Site Location: <u>ME - MW02</u>	Sampler: <u>SE</u>
Well ID: <u>ME - MW02</u>	Weather: <u>FLC</u>

Equipment	
Water quality equipment description:	Interface probe number:
Purging equipment: (please circle)	Bailer type: <u>Plastic</u> Teflon
	Pump type: <u>Peristaltic</u> Submersible Micro-purge Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	<u>50mm</u>	100mm	125mm	150mm	200mm	250mm	300mm	<b>Volume of water in well / V</b> $= Pr \times r \times h$ V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	<u>1.96</u>	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
<u>7.510</u> m	(-) <u>5.200</u> m	(=) <u>2.31</u> m							
		Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume					
		<u>2.31</u> m	(x) <u>1.96</u>	(=) <u>4.528</u>					
Depth to product: <u>-</u> m		Product Thickness: <u>-</u> m		Verified with Bailer: <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N					

Water Quality Parameters								
Beginning purge time: <u>1145</u>			Ending purge time: <u>1150</u>			Pump Intake Depth (mbtoc): <u>600mbtoc</u>		
Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
<u>1</u>	<u>1146</u>	<u>6.83</u>	<u>18.4</u>	<u>780</u>	<u>2.01</u>	<u>-43.8</u>	<u>5.210</u>	<u>clear water, no odour</u>
<u>2</u>	<u>1147</u>	<u>6.67</u>	<u>16.9</u>	<u>745</u>	<u>2.42</u>	<u>-42.3</u>	<u>5.210</u>	<u>"</u>
<u>3</u>	<u>1148</u>	<u>6.66</u>	<u>17.2</u>	<u>755</u>	<u>2.53</u>	<u>-47.0</u>	<u>5.210</u>	<u>"</u>
<u>4</u>	<u>1149</u>	<u>6.64</u>	<u>17.0</u>	<u>749</u>	<u>2.30</u>	<u>-46.4</u>	<u>5.210</u>	<u>"</u>
<u>5</u>	<u>1150</u>	<u>6.64</u>	<u>16.8</u>	<u>746</u>	<u>2.26</u>	<u>-51.2</u>	<u>5.210</u>	<u>"</u>

\*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

<u>5L</u>	<b>Total Well Volume</b> Actual amount of water prior to sampling	Sample time <u>1200</u>	Containers used <u>8</u>
<u>1000</u>	<b>Flow rate</b> mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N Duplicate sample ID <u>-</u>
Rinsate blank collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N Rinsate blank ID <u>-</u>





# Groundwater - Well Sampling Data Form

Job Information	
Date: <u>9/12/03</u>	Time: arrive <u>1235</u> depart _____
Project Name: <u>Symphony</u>	Project Number: <u>0207423</u>
Site Location: <u>ME. Piper</u>	Sampler: <u>SI</u>
Well ID: <u>ME-mw03</u>	Weather: <u>Fine</u>

Equipment	
Water quality equipment description:	Interface probe number:
Purging equipment: (please circle)	Bailer type: <u>Plastic</u> Teflon
	Pump type: <u>Peristaltic</u> Submersible Micro-purge Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = $\pi r^2 h$ V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
<u>7.350</u> m	(-) <u>5.195</u> m	(=) <u>2.155</u> m							
	Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume						
	<u>2.155</u> m	(x) <u>1.96</u>	(=) <u>4.224</u> L						
Depth to product: <u>5.145</u> m	Product Thickness: <u>0.05</u> m	Verified with Bailer: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<u>Photo taken</u>						

Water Quality Parameters								
Beginning purge time:			Ending purge time:				Pump Intake Depth (mbtoc):	
Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
<i>*pH, temp, cond readings not necessary if well is purged dry</i>								
Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth								

<b>Total Well Volume</b> Actual amount of water prior to sampling	Sample time _____	Containers used _____
<b>Flow rate</b> mL/minute	Did field parameters stabilise? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input type="checkbox"/> Y <input type="checkbox"/> N

Field QC Checks			
Was pre-cleaned sampling equipment used for these samples?	<input type="checkbox"/> Y	<input type="checkbox"/> N	
Was pre-cleaning sampling equipment properly protected from contamination?	<input type="checkbox"/> Y	<input type="checkbox"/> N	
Was documentation of equipment conducted?	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y	<input type="checkbox"/> N	Duplicate sample ID _____
Rinsate blank collected?	<input type="checkbox"/> Y	<input type="checkbox"/> N	Rinsate blank ID _____





# Groundwater - Well Sampling Data Form

Job Information	
Date: 18.12.13	Time: arrive 1058 depart
Project Name: Phase II ESA - Mt Piper	Project Number: 02074023
Site Location: Mt Piper Power Plant	Sampler: Chris Ford
Well ID: ME-MW04	Weather: Fine

Equipment	
Water quality equipment description: XSI Pro Plus	Interface probe number: Armet 23973
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible <u>Micro-purge</u> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	<u>50mm</u>	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	<u>1.96</u>	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
<u>8.030</u> m	(-) <u>5.485</u> m	(=) <u>2.545</u> m	<u>mbgl</u>						
	Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume						
	<u>2.545</u> m	(x) <u>1.96</u>	(=) <u>4.988</u> L						
Depth to product: <u>-</u> m	Product Thickness: <u>-</u> m	Verified with Bailer:	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N						

Water Quality Parameters								
Beginning purge time: <u>1112</u>			Ending purge time: <u>1152</u>			Pump Intake Depth (mbtoc): <u>6.00</u>		
Litres	Time	PH	Temp °C	Cond $\mu$ S/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.1	1121	6.11	23.3	1086	0.23	4.8	5.492	cloudy, no odor or sheen
0.5	1127	6.12	21.4	1043	0.36	6.1	5.501	Same as above
1.0	1132	6.10	19.6	1015	1.32	7.1	5.507	Same as above
1.5	1137	6.11	19.6	1020	0.34	6.7	5.511	Same as above
2.0	1141	6.12	19.7	1017	0.36	6.6	5.520	Slightly cloudy, no odor, no sheen
2.5	1144	6.11	19.3	1011	0.37	6.2	5.521	Same as above
3.0	1148	6.12	19.3	1008	0.37	6.0	5.521	Same as above
3.5	1152	6.12	19.1	1005	0.39	6.4	5.521	Clear, no odor or sheen

\*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

<u>3.5</u>	Total Well Volume Actual amount of water prior to sampling	Sample time <u>1152</u>	Containers used <u>7</u>
<u>100</u>	Flow rate mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N

Field QC Checks			
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	Fill: 60s → 50s Discharge: 15s
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA	
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N <input type="checkbox"/> NA	
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA	
Duplicate sample collected?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N	Duplicate sample ID <u>-</u>
Rinsate blank collected?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N	Rinsate blank ID <u>-</u>

Well gauged from ground level needs to be adjusted for with successive starts



# Groundwater - Well Sampling Data Form

Job Information			
Date:	19.12.13	Time: arrive	13.45 depart 14.40
Project Name:	Symphony	Project Number:	0207423
Site Location:	Mt Piper	Sampler:	T. Shaw
Well ID:	ME-MW05	Weather:	fine

Equipment			
Water quality equipment description:	YSI (104100323)	Interface probe number:	Geotech
Purging equipment: (please circle)	Bailer type: Plastic	Teflon	
	Pump type: Peristaltic	Submersible	Micro-purge Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Total Well Depth	(-) Water level	(=) Water Column							
6.036 m	(-) 5.180 m	(=) 0.856 m							
			Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume				
			~ 0.86 m	(x) ~ 2	(=) ~ 1.72 L				
Depth to product:	— m		Product Thickness:	— m		Verified with Bailer:	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N		

Water Quality Parameters									
Beginning purge time: 13.53			Ending purge time:				Pump Intake Depth (mbtoc):		
Litres	Time	PH	Temp °C	Cond µS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments	
0.2	13.58	6.49	21.5	922	0.27	35	5.185	cloudy, brown, no odour	
0.5	14.01	6.50	21.4	760	0.35	23.8	5.187		
0.8	14.04	6.54	20.6	747	0.27	27.9	5.188		
1.1	14.07	6.49	19.9	738	0.27	29.2	5.190		
1.4	14.10	6.50	19.7	737	0.30	27.9	5.190		
1.7	14.13	6.60	19.7	737	0.35	26.6	—		
2.0	14.16	6.55	19.6	736	0.35	26.1	5.191		
*pH, temp, cond readings not necessary if well is purged dry							Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth		
2 L	Total Well Volume			Sample time			Containers used		
100	Actual amount of water prior to sampling			14.17			6		
Flow rate mL/minute				Did field parameters stabilise?			Was the well dry purged?		
				Y N NA			Y N		

Field QC Checks			
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N	<input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N	
Rinsate blank collected?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N	
Duplicate sample ID		_____	
Rinsate blank ID		_____	





# Groundwater - Well Sampling Data Form

Job Information	
Date: 19/12/13	Time: arrive 1400 depart 1500
Project Name: Symphony	Project Number: 0207423
Site Location: Mt Piper	Sampler: SE
Well ID: ME - mhw06	Weather: Fine

Equipment	
Water quality equipment description:	Interface probe number: Airmet
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible Micro-purge Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
5.475 m	(-) 5.070 m	(=) 0.405 m							
		Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume					
		0.405 m	(x) 1.96	(=) 1.774 L					
Depth to product:	— m	Product Thickness:	— m	Verified with Bailer:	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N				

Water Quality Parameters								
Beginning purge time: 1435			Ending purge time: 1447			Pump Intake Depth (mbtoc): 5.30 m bto c		
Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
1	1440	7.34	19.4	805	0.57	-77.1	5.070	Dark brownish green, muddy turb
2	1445	6.48	18.3	770	0.57	-34.1	5.070	"
3	1446	6.56	17.1	735	0.32	-45.2	5.070	" low turb, no odour
4	1447	6.59	16.8	725	0.35	-44.2	5.070	" clear water

\*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

4L	Total Well Volume	Sample time: 1450	Containers used: 7
330	Actual amount of water prior to sampling	Flow rate: mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
			Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Rinsate blank collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Duplicate sample ID	—
Rinsate blank ID	—













# Groundwater - Well Sampling Data Form

Job Information	
Date: 17.12.13	Time: arrive 1525 depart 1652
Project Name: Phase II ESA - Mt Ripper	Project Number: 0207423
Site Location: Mt Ripper Power Station	Sampler: C. Ford
Well ID: MF - MW01	Weather: Fine

Equipment	
Water quality equipment description: YSI Pro Plus	Interface probe number: Armet 23973
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible <u>Micro-purge</u> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = $\pi r^2 \times h$ V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
1607 m	(-) 15.01 m	(=) 1.06 m							
			Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume				
			1.06 m	(x) 1.96	(=)				
Depth to product: - m		Product Thickness: - m		Verified with Bailer:		Y <input checked="" type="checkbox"/> N			

Water Quality Parameters									
Beginning purge time: 1545			Ending purge time:				Pump Intake Depth (mbtoc): 1530		
Litres	Time	PH	Temp °C	Cond $\mu$ S/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments	
0.1	1551	6.43	26.1	346.4	0.21	32.8	1507	very turbid, no odour or green	
0.5	1557	5.84	23.8	298.4	0.19	64.0	1425	Same as above	
1.0	1605	5.88	23.8	296.5	0.24	79.0	1442	Same as above	
1.5	1610	5.88	23.1	292.3	0.29	84.9	1450	Same as above	
2.0	1615	5.89	22.4	287.3	0.32	88.9	1450	Same as above	
2.5	1620	5.87	21.0	281.0	0.31	89.9	1452	turbid, no odour or green	
3.0	1625	5.87	20.8	281.0	0.32	90.6	1454	Same as above	
3.5	1632	5.89	21.0	287.8	0.19	90.1	1455	Same as above	
*pH, temp, cond readings not necessary if well is purged dry									
Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth									
3.5	Total Well Volume			Sample time 1632			Containers used 6		
Actual amount of water prior to sampling									
100	Flow rate mL/minute			Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA			Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N		

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Rinsate blank collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Duplicate sample ID _____	
Rinsate blank ID _____	

Fill: 15s  
Discharge: 60s

Well gauged from gravel level needs to be adjusted to TOC with surveying





# Groundwater - Well Sampling Data Form

Job Information	
Date: 17.12.13	Time: arrive 1400 depart 1520
Project Name: Phase 4 BSA - Mt Piper	Project Number: 0207423
Site Location: Mt Piper Power Station	Sampler: C. Ford
Well ID: MF_MW02	Weather: Fine

Equipment	
Water quality equipment description: XSI Pro Plus	Interface probe number: Arnet 23973
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible <b>Micro-purge</b> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
25.24 m	(-) 14.70 m	(=) 10.54 m							
	Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume						
	10.54 m	(x) 1.96	(=) 20.67 L						
Depth to product: - m	Product Thickness: - m	Verified with Bailer: <input type="checkbox"/> Y <input checked="" type="checkbox"/> N							

Water Quality Parameters								
Beginning purge time: 1419			Ending purge time: 1503			Pump Intake Depth (mbtoc):		
Litres	Time	PH	Temp °C	Cond µS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.1	1425	6.20	24.2	496.8	5.03	-3.0	5.00	cloudy, no odour or steel
0.5	1429	6.07	21.5	440.1	2.71	18.4	15.02	Same as above
1.0	1434	6.11	21.1	481.4	0.83	15.0	15.27	Same as above
1.5	1439	6.13	20.7	428.8	0.31	14.5	15.31	Same as above
2.0	1444	6.13	20.6	427.3	0.28	14.9	15.42	Same as above
2.5	1448	6.13	20.5	425.3	1.06	14.8	15.46	Same as above
3.0	1453	6.13	20.2	424.0	0.42	14.9	15.46	Same as above
3.5	1458	6.13	20.3	424.0	1.15	15.5	15.46	Same as above
4.0	1503	6.13	20.1	422.5	0.26	15.0	15.48	Same as above

\*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

4.0	<b>Total Well Volume</b> Actual amount of water prior to sampling	Sample time 1503	Containers used 6
100	<b>Flow rate</b> mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N

Field QC Checks			
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	Discharge @ 15s All @ 60s
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA	
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N <input type="checkbox"/> NA	
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA	
Duplicate sample collected?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N	Duplicate sample ID _____
Rinsate blank collected?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N	Rinsate blank ID _____

\* Same as MF\_MW01





# Groundwater - Well Sampling Data Form

Job Information	
Date: 18.12.13	Time: arrive 0820 depart 0945
Project Name: Phase II ESA - Mt Piper	Project Number: 0207423
Site Location: Mt Piper Power Station	Sampler: C. Ford
Well ID: MF-MW03	Weather: Fine

Equipment	
Water quality equipment description: YSI Pro Plus	Interface probe number: Hirmet 23973
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible <u>Micro-purge</u> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V $= Pr \times r \times h$ V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
13.24 m	(-) 8.493 m	(=) 4.75 m	m						
			Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume				
			4.75 m	(x) 1.96	(=) 9.3 L				
Depth to product: - m			Product Thickness: - m		Verified with Bailer: <input type="checkbox"/> Y <input checked="" type="checkbox"/> N				

Water Quality Parameters								
Beginning purge time: 0834			Ending purge time: 0913			Pump Intake Depth (mbtoc): 11.0		
Litres	Time	PH	Temp °C	Cond $\mu$ S/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.1	0838	5.73	18.4	312.0	0.30	160.9	8.59	turbid, no odour or sheen
0.5	0841	5.42	17.7	317.2	0.19	173.2	8.70	turbid, no odour, slight sheen
1.0	0844	5.36	17.7	315.2	0.17	176.9	8.75	Same as above
1.5	0849	5.35	18.1	313.2	0.99	180.0	9.02	Same as above
2.0	0855	5.32	18.2	312.3	1.100	185.0	9.151	Same as above
2.5	0901	5.32	18.3	311.7	1.210	189.7	9.181	Same as above
3.0	0907	5.30	18.3	313.6	1.261	182.6	9.22	Same as above
3.5	0913	5.30	18.4	315.1	1.221	194.9	9.22	Same as above
*pH, temp, cond readings not necessary if well is purged dry								
Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth								
3.5	Total Well Volume			Sample time 0913		Containers used 7		
Actual amount of water prior to sampling								
100	Flow rate mL/minute			Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA		Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N		

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Rinsate blank collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Duplicate sample ID _____	
Rinsate blank ID _____	

Well gauged from ground level needs to be adjusted to with surveying data





# Groundwater - Well Sampling Data Form

Job Information	
Date: 16.12.13	Time: arrive 1615 depart 1720
Project Name: Phase II ESA - Mt Piper	Project Number: 0207423
Site Location: MT Piper Power station	Sampler: C. Ford
Well ID: AG-5803 MF-MW04	Weather: Overcast

Equipment	
Water quality equipment description: YSI Pro Plus	Interface probe number: Ammet 23173
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible <u>Micro-purge</u> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = $\pi r^2 h$ V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water Level	(=) Water Column							
15.80 m	11.724 m	4.076 m							
	Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume						
	4.076 m	1.96	7.93 L						
Depth to product: NA m	Product Thickness: NA m	Verified with Bailer: <input type="checkbox"/> Y <input checked="" type="checkbox"/> N							

Water Quality Parameters								
Beginning purge time: 1629			Ending purge time:				Pump Intake Depth (mbtoc): 13.5m	
Litres	Time	PH	Temp °C	Cond $\mu$ S/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.1	1634	6.03	21.7	195.2	0.13	114.2	11.936	Slightly Silty, no odour or taste
0.5	1638	5.36	18.6	174.7	0.15	174.7	11.960	Same as above
1.0	1642	5.35	18.3	178.8	0.18	137.1	11.921	Same as above
1.5	1647	5.39	18.2	186.1	0.19	135.5	11.924	Same as above
2.0	1651	5.42	18.1	193.6	0.20	134.2	11.930	Same as above
2.5	1654	5.44	18.0	201.1	0.21	132.4	11.931	Same as above
3.0	1658	5.46	18.0	212.1	0.33	127.1	11.933	Same as above
3.5	1702	5.47	18.0	218.4	0.24	123.7	11.934	Same as above
4.0	1708	5.47	17.9	220.6	0.30	122.6	11.935	Same as above
*pH, temp, cond readings not necessary if well is purged dry						Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth		
4.0	Total Well Volume			Sample time: 1708		Containers used: 6		
125	Actual amount of water prior to sampling			Flow rate mL/minute		Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA		
						Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N		

Field QC Checks		
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N
Rinsate blank collected?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N
Duplicate sample ID		—
Rinsate blank ID		—

Fill: 50s  
Discharges: 10s

\* Same as MF-MW01





# Groundwater - Well Sampling Data Form

Job Information	
Date: <u>16.12.13</u>	Time: arrive <u>0925</u> depart <u>1130</u>
Project Name: <u>Phase II ESA - Mt Piper</u>	Project Number: <u>0207423</u>
Site Location: <u>Mt Piper Power Plant</u>	Sampler: <u>C. Ford</u>
Well ID: <u>ME-MW05</u>	Weather: <u>Overcast</u>

Equipment	
Water quality equipment description: <u>YSI ProPlus</u>	Interface probe number: <u>Armet 23973</u>
Purging equipment: (please circle)	Bailer type: <u>Plastic</u> Teflon
	Pump type: <u>Peristaltic</u> Submersible <u>Micro-purge</u> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	<u>50mm</u>	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	<u>1.96</u>	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
<u>28.258</u> m	(-) <u>26.557</u> m	(=) <u>1.701</u> m							
<u>27.668</u>	<u>25.967</u>	Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume					
		<u>1.701</u> m	(x) <u>1.96</u>	(=) <u>3.33</u> L					
Depth to product: <u>NA</u> m	Product Thickness: <u>NA</u> m	Verified with Bailer: <input type="checkbox"/> Y <input checked="" type="checkbox"/> N							

Water Quality Parameters									
Beginning purge time: <u>0948</u>		Ending purge time: <u>1112</u>		Pump Intake Depth (mbtoc): <u>27.5m</u>					
Litres	Time	PH	Temp °C	Cond $\mu$ S/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments	
0.1	1006	7.31	20.8	586	1.47	87.9	<u>26.19</u>	Silty, no odour or sheen	
0.5	1015	6.48	19.0	543	<u>0.77</u>	70.9	<u>26.292</u>	Same as above	
1.0	1020	6.43	18.7	513	0.52	75.1	<u>26.351</u>	Same as above	
1.5	1026	6.49	19.1	557	0.33	64.5	<u>26.372</u>	Same as above	
2.0	1036	6.48	19.4	540	0.24	57.9	below hp	Same as above	
2.5	1042	6.45	19.5	537	0.19	58.3	"	" " "	
3.0	1050	6.50	21.5	591	0.15	62.9	"	clear, no odour, or sheen	
3.5	1058	6.52	21.8	615	0.77	69.5	"	clear, no odour, or sheen	
4.0	1105	6.51	21.7	616	0.70	71.9	"	clear, no odour or sheen	
4.5	1112	6.52	21.7	618	0.73	70.1	"	clear, no odour or sheen	
*pH, temp, cond readings not necessary if well is purged dry				Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth					
<u>45</u>	Total Well Volume			Actual amount of water prior to sampling		Sample time	<u>1112</u>	Containers used	<u>6</u>
<u>100</u>	Flow rate			mL/minute		Did field parameters stabilise?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged?	<input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N

Field QC Checks		
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N
Rinsate blank collected?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N
Duplicate sample ID		<u>NA</u>
Rinsate blank ID		<u>NA</u>

\*Same as ME-MW01





# Groundwater - Well Sampling Data Form

Job Information	
Date: 17.12.13	Time: arrive 1245 depart 1345
Project Name: Phase 4 BSA - Mt Roper	Project Number: 0207423
Site Location: Mt Roper Power Station	Sampler: Chris Pora
Well ID: MG-X-MPI	Weather: fine

Equipment	
Water quality equipment description: XSI Pro Plus	Interface probe number: Armet 23973
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible Micro-purge Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = $\pi r^2 h$ V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
28.82 m	(-) 17.76 m	(=) 1.06 m							
	Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume						
	1.06 m	(x) 1.96	(=) 2.0776 L						
Depth to product: - m	Product Thickness: - m	Verified with Bailer:	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N						

Water Quality Parameters									
Beginning purge time: 1305		Ending purge time: 1330			Pump Intake Depth (mbtoc):				
Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments	
0.1	1330	-	-	-	-	-	-	Purged dry, grab sample taken, Limited Sample	
				*pH, temp, cond readings not necessary if well is purged dry					
				Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth					
Total Well Volume		Actual amount of water prior to sampling		Sample time: 1330		Containers used: 6			
Flow rate		mL/minute		Did field parameters stabilise?		Was the well dry purged?			
				<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N			

Field QC Checks		
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N
Rinsate blank collected?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N
Duplicate sample ID		-
Rinsate blank ID		-

Well gauged from ground level needs to be adjusted to TOC with surveying data





# Groundwater - Well Sampling Data Form

Job Information	
Date: 4/11/13	Time: arrive 09:45 depart 11:20
Project Name: Symphony Stage 2	Project Number: 0207423
Site Location: Mt. Piper	Sampler: S. Holloman
Well ID: M9-X-4/D1	Weather: Fine.

Equipment	
Water quality equipment description: YSI.	Interface probe number: SYD3985 30M.
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible <b>Micro-purge</b> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth (-) Water level (=) Water Column	11.009 m (-)	2.153 m (-)	8.856 m (=)						
Water Column (x) Conversion Factor (=) Litres per 1 Well Volume		8.856 m (x)	1.96 (=)	17.712 L					
Depth to product: _____ m	Product Thickness: _____ m	Verified with Bailer: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N							

Water Quality Parameters									
Beginning purge time: 10:38		Ending purge time: 10:59		Pump Intake Depth (mbtoc): 10.509					
Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments	
0.8	10:39	6.09	15.0	2856	3.16	13.92	2.217	yellow, slightly cloudy, no odour	
1.6	10:43	5.94	14.6	2658	0.24	16.9	2.238	" " " "	
2.4	10:47	5.93	14.7	2589	0.24	15.4	2.255	clear, suspended particles, no odour	
3.2	10:51	5.94	14.7	2560	0.34	14.3	2.261	" " " "	
4.0	10:55	5.94	14.7	2545	0.23	13.6	2.269	" " " "	
4.8	10:59	5.94	14.7	2533	0.24	13.2	2.273	" " " "	
*pH, temp, cond readings not necessary if well is purged dry				Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth					
17.712	Total Well Volume Actual amount of water prior to sampling		Sample time 11:00		Containers used 16				
200.	Flow rate mL/minute		Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA		Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N				

Field QC Checks		
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Rinsate blank collected?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N

Metals TRH, BTEX, PAH, Phenols, Cations / Anions.

Duplicate sample ID: D02-GW-04 1113

Rinsate blank ID: ~~RB-GW-04~~ RB-GW-04 1113



# Groundwater - Well Sampling Data Form

Job Information	
Date: <u>7/11/13</u>	Time: arrive <u>09:06</u> depart <u>10:10</u>
Project Name: <u>Symphony Stage 2</u>	Project Number: <u>0207423</u>
Site Location: <u>M-F Piper</u>	Sampler: <u>S. Holloman</u>
Well ID: <u>MG-X-4/D3</u>	Weather: <u>Fine</u>

Equipment	
Water quality equipment description: <u>YSI</u>	Interface probe number: <u>SYD3985 30M</u>
Purging equipment: (please circle)	Bailer type: <u>Plastic</u> Teflon
	Pump type: <u>Peristaltic</u> <u>Submersible</u> <u>Micro-purge</u> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	<u>50mm</u>	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = $\pi r^2 \times h$ V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	<u>1.96</u>	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth <u>16.273</u> m (-) Water level <u>7.002</u> m (=) Water Column <u>9.273</u> m									
		Water Column <u>9.273</u> m (x) Conversion Factor <u>1.96</u> (=) Litres per 1 Well Volume <u>18.546</u> L							
Depth to product: <u>    </u> m		Product Thickness: <u>    </u> m							Verified with Bailer: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N

Water Quality Parameters								
Beginning purge time: <u>09:28</u>			Ending purge time: <u>09:50</u>			Pump Intake Depth (mbtoc): <u>15.775</u>		
Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
<u>0.2</u>	<u>09:30</u>	<u>6.65</u>	<u>20.3</u>	<u>946</u>	<u>4.30</u>	<u>46.8</u>	<u>6.965</u>	<u>turbid, brown, no odour</u>
<u>1.0</u>	<u>09:34</u>	<u>6.19</u>	<u>18.0</u>	<u>896</u>	<u>3.65</u>	<u>19.9</u>	<u>7.041</u>	<u>slightly cloudy, green, pale brown, no odour</u>
<u>1.8</u>	<u>09:38</u>	<u>6.06</u>	<u>17.9</u>	<u>887</u>	<u>0.51</u>	<u>22.5</u>	<u>7.050</u>	<u>" " "</u>
<u>2.6</u>	<u>09:42</u>	<u>6.06</u>	<u>17.7</u>	<u>881</u>	<u>0.34</u>	<u>20.3</u>	<u>7.057</u>	<u>" " "</u>
<u>3.4</u>	<u>09:46</u>	<u>6.05</u>	<u>17.3</u>	<u>867</u>	<u>0.23</u>	<u>19.6</u>	<u>7.091</u>	<u>" " pale "</u>
<u>4.2</u>	<u>09:50</u>	<u>6.05</u>	<u>17.4</u>	<u>870</u>	<u>0.23</u>	<u>18.3</u>	<u>7.112</u>	<u>slightly cloudy, yellow, no odour</u>

\*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

<u>18.546</u>	Total Well Volume Actual amount of water prior to sampling	Sample time <u>09:51</u>	Containers used <u>6</u>
<u>200</u>	Flow rate mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Rinsate blank collected?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
	Duplicate sample ID <u>    </u>
	Rinsate blank ID <u>    </u>



# Groundwater - Well Sampling Data Form

Job Information	
Date: 8/11/13	Time: arrive 13:50 depart 14:45
Project Name: Symphony Stage 2	Project Number: 0207428
Site Location: Mt Piper	Sampler: S. Holloman / D. Brookes
Well ID: MG-X-4/D4	Weather: Fine

Equipment	
Water quality equipment description: YSI	Interface probe number: SPD 3985 30M
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible <b>Micro-purge</b> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = $\pi r^2 \times h$ V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
7.123 m	1.660 m	5.463 m							
			Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume				
			5.463 m	1.96	10.926 L				
Depth to product: _____ m		Product Thickness: _____ m		Verified with Bailer: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N					

Water Quality Parameters								
Beginning purge time: 14:03		Ending purge time: 14:24		Pump Intake Depth (mbtoc): 6.623				
Litres	Time	pH	Temp °C	Cond $\mu\text{S}/\text{cm}$	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.2	14:04	3.57	18.5	1160	0.06	319.8	1.660	Slightly cloudy, no odour
1.0	14:08	3.44	18.2	1204	0.11	279.7	1.660	clear, no odour
1.8	14:12	3.36	18.6	1229	0.17	269.4	1.660	" "
2.6	14:16	3.32	18.6	1254	0.49	269.6	1.660	" "
3.4	14:20	3.31	18.0	1250	0.24	263.0	1.660	" "
4.2	14:24	3.31	17.0	1232	0.63	255.1	1.660	" "
*pH, temp, cond readings not necessary if well is purged dry				Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth				

10.926	Total Well Volume Actual amount of water prior to sampling	Sample time 14:25	Containers used 6
200	Flow rate mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N

Field QC Checks			
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> NA
Duplicate sample collected?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	
Rinsate blank collected?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	
Duplicate sample ID _____		Rinsate blank ID RB.GW9-08/11/13	





# Groundwater - Well Sampling Data Form

Job Information	
Date: 1/11/13	Time: arrive 12:00 depart 13:30
Project Name: Symphony stage 2	Project Number: 0207423
Site Location: Mt. Piper	Sampler: S. Holloman
Well ID: MG-X- <del>545</del> 4/D5	Weather: Fine

Equipment	
Water quality equipment description: YSI	Interface probe number: SYD 3985 30M
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible <b>Micro-purge</b> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	<b>Volume of water in well / V</b> = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
21.650 m	(-) 11.090 m	(=) 10.560 m							
			Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume				
			10.560 m	(x) 1.96	(=) 21.120 L				
Depth to product:	_____ m	Product Thickness:	_____ m	Verified with Bailer:		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N			

Water Quality Parameters								
Beginning purge time: 12:33			Ending purge time: 12:52			Pump Intake Depth (mbtoc): 21.150		
Litres	Time	PH	Temp °C	Cond µS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.2	12:34	5.93	22.6	1000	4.11	-9.0	11.090	clear, yellow, no odour
1.0	12:37	6.08	19.8	1115	8.81	-4.1	11.090	" " "
1.8	12:40	6.11	19.6	1150	4.50	-3.3	11.090	slightly cloudy, no odour
2.6	12:43	6.09	18.8	1180	1.30	-7.1	11.090	" "
3.4	12:46	6.08	18.6	1195	0.62	-10.7	11.090	" "
4.2	12:49	6.04	17.4	1190	0.33	-7.4	11.090	" "
5.0	12:52	6.04	17.4	1190	0.28	-6.9	11.090	" "
*pH, temp, cond readings not necessary if well is purged dry						Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth		

~ 21.120	<b>Total Well Volume</b> Actual amount of water prior to sampling	Sample time: 12:54	Containers used: 6
200	<b>Flow rate</b> mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Rinsate blank collected?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Duplicate sample ID: _____	
Rinsate blank ID: RB-GW4-011113	

Metals TRH, BTEX, PAH, Phenols, Cations / Anions



# Groundwater - Well Sampling Data Form

Job Information	
Date: 7/11/13	Time: arrive 07:50 depart 08:45
Project Name: Symphony Stage 2	Project Number: 0207423
Site Location: MG Piper	Sampler: S. Holloman
Well ID: MG-X-4/D9	Weather: Fine

Equipment	
Water quality equipment description: YSI	Interface probe number: SYD 3985 30m
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible <b>Micro-purge</b> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
4.040 m	(-) 1.690 m	(=) 2.350 m							
			Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume				
			2.350 m	(x) 1.96	(=) 4.700 L				
Depth to product: _____ m		Product Thickness: _____ m		Verified with Bailer: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N					

Water Quality Parameters								
Beginning purge time: 08:07			Ending purge time: 08:24			Pump Intake Depth (mbtoc): ~3.540		
Litres	Time	PH	Temp °C	Cond µS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.2	07:56	6.19	13.6	1992	0.82	16.7	1.713	clear, yellow, no odour
1.0	08:12	6.16	13.3	1924	0.13	17.0	1.783	" " "
1.8	08:16	6.15	13.5	1921	0.13	14.0	1.825	" " "
3.0	08:20	6.15	13.6	1915	0.09	9.0	1.942	" " "
4.0	08:24	6.15	14.0	1936	0.06	5.4	1.861	" " "
5.0	08:24	6.15	14.1	1943	0.06	3.3	1.853	" " "
*pH, temp, cond readings not necessary if well is purged dry				Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth				

~4.700	Total Well Volume Actual amount of water prior to sampling	Sample time 08:25	Containers used 6
200	Flow rate mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Rinsate blank collected?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Duplicate sample ID _____ Rinsate blank ID _____	

Metals, TRH, BTEX, PAH, Phenols, cations/anions





# Groundwater - Well Sampling Data Form

Job Information	
Date: <u>6/11/13</u>	Time: arrive <u>10:15</u> depart <u>11:05</u>
Project Name: <u>Symphony stage 2</u>	Project Number: <u>0207423</u>
Site Location: <u>Mt. Piper</u>	Sampler: <u>D. Brookes / S. Holloman</u>
Well ID: <u>MG-X-4/D10</u>	Weather: <u>Fine</u>

Equipment	
Water quality equipment description: <u>YSI</u>	Interface probe number: <u>SYD 3984 60M</u>
Purging equipment: (please circle)	Bailer type: <u>Plastic</u> Teflon
	Pump type: <u>Peristaltic</u> Submersible <u>Micro-purge</u> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	<u>50mm</u>	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	<u>1.96</u>	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth (-) Water Level (=) Water Column	<u>23.955</u> m (-)	<u>13.945</u> m (-)	<u>10.010</u> m (=)						
Water Column (x) Conversion Factor (=) Litres per 1 Well Volume		<u>10.010</u> m (x)	<u>1.96</u>	<u>20.020</u> L (=)					
Depth to product: _____ m	Product Thickness: _____ m	Verified with Bailer: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N							

Water Quality Parameters									
Beginning purge time: <u>10:28</u>		Ending purge time:			Pump Intake Depth (mbtoc): <u>18.23.455</u>				
Litres	Time	PH	Temp °C	Cond $\mu$ S/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments	
<u>0.2</u>	<u>10:32</u>	<u>5.54</u>	<u>22.0</u>	<u>4037</u>	<u>1.46</u>	<u>164.8</u>	<u>13.945</u>	<u>clear, no odour</u>	
<u>1.0</u>	<u>10:36</u>	<u>5.41</u>	<u>20.8</u>	<u>5447</u>	<u>1.32</u>	<u>165.1</u>	<u>13.945</u>	" "	
<u>1.8</u>	<u>10:40</u>	<u>5.35</u>	<u>20.5</u>	<u>5589</u>	<u>1.04</u>	<u>168.4</u>	<u>13.945</u>	" "	
<u>2.6</u>	<u>10:44</u>	<u>5.33</u>	<u>21.1</u>	<u>5681</u>	<u>0.91</u>	<u>169.0</u>	<u>13.945</u>	" "	
<u>3.4</u>	<u>10:48</u>	<u>5.33</u>	<u>21.2</u>	<u>5699</u>	<u>0.73</u>	<u>170.2</u>	<u>13.945</u>	" "	
<u>4.2</u>	<u>10:52</u>	<u>5.32</u>	<u>19.6</u>	<u>5523</u>	<u>0.60</u>	<u>170.4</u>	<u>13.945</u>	" "	
*pH, temp, cond readings not necessary if well is purged dry				Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth					
<u>20.020</u>	Total Well Volume Actual amount of water prior to sampling		Sample time <u>10:53</u>		Containers used <u>6</u>				
<u>200</u>	Flow rate mL/minute		Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA		Was the well dry purged? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA				

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Rinsate blank collected?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Duplicate sample ID _____ Rinsate blank ID _____	

*Metals, TRH, BTEX, PAH, Phenols, cations / anions*



# Groundwater - Well Sampling Data Form

Job Information	
Date: 6/11/13	Time: arrive _____ depart _____
Project Name: Symphony Stage 2	Project Number: 0207423
Site Location: Mt. Piper	Sampler: D. Brookes / S. Holloman
Well ID: MG-X-4/D11	Weather: Fine

Equipment	
Water quality equipment description:	Interface probe number: SYD 3984 60m
Purging equipment: (please circle)	Bailer type: Plastic Teflon Pump type: Peristaltic Submersible Micro-purge Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
17.400 m	(-) _____ m	(=) _____ m							
Water Column		(x) Conversion Factor	(=) Litres per 1 Well Volume						
_____ m		(x) _____	(=) _____						
Depth to product: _____ m	Product Thickness: _____ m	Verified with Bailer:	<input type="checkbox"/> Y <input type="checkbox"/> N						

Water Quality Parameters																																																																																								
Beginning purge time:			Ending purge time:				Pump Intake Depth (mbtoc):																																																																																	
Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments																																																																																
<del> <table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table> </del>																																																																																								Not sampled dry
*pH, temp, cond readings not necessary if well is purged dry								Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth																																																																																
Total Well Volume			Sample time _____			Containers used _____																																																																																		
Actual amount of water prior to sampling																																																																																								
Flow rate mL/minute			Did field parameters stabilise?			Was the well dry purged?																																																																																		
			<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA			<input type="checkbox"/> Y <input type="checkbox"/> N																																																																																		

Field QC Checks			
Was pre-cleaned sampling equipment used for these samples?	Y	N	
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N	
Was documentation of equipment conducted?	Y	N	NA
Were air bubbles present in vials at time of collection?	Y	N	NA
Was sample for metals field filtered prior to preservations?	Y	N	NA
Duplicate sample collected?	Y	N	Duplicate sample ID _____
Rinsate blank collected?	Y	N	Rinsate blank ID _____



# Groundwater - Well Sampling Data Form

Job Information	
Date: 31/10/13	Time: arrive 16:50 depart 18:00
Project Name: Symphony Stage 2	Project Number: 0207423
Site Location: M1 Piper	Sampler: S. Holloman
Well ID: M1-X-5/D2	Weather: Fine

Equipment	
Water quality equipment description: YSI	Interface probe number: SYD 3985 30M
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible <b>Micro-purge</b> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
13.825 m	(-) 12.105 m	(=) 1.720 m							
			Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume				
			1.720 m	(x) 1.96	(=) 3.440 L				
Depth to product: — m		Product Thickness: — m		Verified with Bailer: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N					

Water Quality Parameters								
Beginning purge time: 17:18			Ending purge time: 17:39			Pump Intake Depth (mbtoc): 3.325		
Litres	Time	PH	Temp °C	Cond µS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.2	17:19	5.57	20.5	1125	3.14	40.4	12.110	Slightly cloudy, no odour
1.0	17:23	5.47	18.6	1131	1.44	53.5	12.110	" "
1.8	17:27	5.47	18.2	1131	0.46	65.1	12.110	" "
2.6	17:31	5.49	18.0	1133	0.54	71.1	12.110	" "
3.4	17:35	5.54	18.0	1121	0.62	73.2	12.110	" "
4.2	17:39	5.55	18.1	1114	0.63	72.0	12.110	" "
*pH, temp, cond readings not necessary if well is purged dry						Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth		
3.440		Total Well Volume			Sample time 17:40		Containers used 6	
200		Flow rate mL/minute			Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA		Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N	

Field QC Checks		
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Metals, TRH, BTEX, PAH, Phenols, Catrons / Anions, VOC suite, PCB
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA	
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	
Rinsate blank collected?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Duplicate sample ID: —
		Rinsate blank ID: RB-GW3-311013





# Groundwater - Well Sampling Data Form

Job Information	
Date: 31/10/13	Time: arrive 15:00 depart 16:35
Project Name: Symphony stage 2	Project Number: 0207423
Site Location: Mt. Piper	Sampler: S. Holloman
Well ID: M1-X-5/D23 (Beneath cap 5/3)	Weather: Fine

Equipment	
Water quality equipment description: YSI	Interface probe number: SYD 3985 30M
Purging equipment: (please circle)	Bailer type: Plastic Teflon Pump type: Peristaltic Submersible <b>Micro-purge</b> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
16.395 m	(-) 11.570 m	(=) 4.825 m							
	Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume						
	4.825 m	(x) 1.96	(=) 9.46 L						
Depth to product: _____ m	Product Thickness: _____ m	Verified with Bailer: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N							

Water Quality Parameters								
Beginning purge time: 15:59			Ending purge time: 16:21			Pump Intake Depth (mbtoc): 16.395		
Litres	Time	PH	Temp °C	Cond µmS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.8	16:00	5.93	17.4	798	0.52	21.9	10.570	Brown, turbid, no odour
1.6	16:03	5.92	17.5	799	0.45	27.1	11.570	yellow, clear, no odour
2.4	16:06	5.94	18.5	812	0.40	33.2	11.570	" " "
3.2	16:09	5.93	18.5	817	0.50	34.5	11.570	clear, no odour
4.0	16:12	5.94	18.2	819	0.57	35.2	11.570	" "
4.8	16:15	5.94	18.2	822	0.57	35.2	11.570	" "
5.6	16:18	5.93	18.0	824	0.55	35.4	11.570	" "
6.4	16:21	5.94	17.9	829	0.54	33.9	11.570	" "

\*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

10.670	Total Well Volume	Actual amount of water prior to sampling	Sample time 16:22	Containers used 6
200	Flow rate	mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Rinsate blank collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Metals, TRH, BTEX, PAH, Phenols, Cations / Anions, VOC suite, PCB	
Duplicate sample ID	_____
Rinsate blank ID	_____



# Groundwater - Well Sampling Data Form

Job Information	
Date: 31/10/13	Time: arrive 14:45 depart 14:55
Project Name: Symphony stage 2	Project Number: 0207423
Site Location: Mt. Piper	Sampler: S. Holloman
Well ID: M1-X-5/D6	Weather: Fine

Equipment	
Water quality equipment description: YSI	Interface probe number: SYD 3985 30M
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible <b>Micro-purge</b> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = $\pi r^2 \times h$ V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
10.435 m	(-) m	(=) m							
Water Column		(x) Conversion Factor	(=) Litres per 1 Well Volume						
		m (x) 1.96	(=) m						
Depth to product:	Product Thickness:		Verified with Bailer:						
			L						
			Y N						

Water Quality Parameters									
Beginning purge time:			Ending purge time:				Pump Intake Depth (mbtoc):		
Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments	
								Well Dry. Not Sampled.	
*pH, temp, cond readings not necessary if well is purged dry									
Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth									

Total Well Volume Actual amount of water prior to sampling	Sample time	Containers used
	Flow rate mL/minute	Did field parameters stabilise? Y N NA

Field QC Checks		
Was pre-cleaned sampling equipment used for these samples?	Y	N
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N
Was documentation of equipment conducted?	Y	N NA
Were air bubbles present in vials at time of collection?	Y	N NA
Was sample for metals field filtered prior to preservations?	Y	N NA
Duplicate sample collected?	Y	N
Rinsate blank collected?	Y	N
Duplicate sample ID		
Rinsate blank ID		



# Groundwater - Well Sampling Data Form

Job Information	
Date: 31/10/13	Time: arrive 15:20 depart 15:30
Project Name: Symphony	Project Number: 0707432
Site Location: Mt. Piper	Sampler: D. Brookes
Well ID: MI-X-5/07	Weather: Fine

Equipment	
Water quality equipment description: Y51	Interface probe number: 3894
Purging equipment: (please circle)	Bailer type: Plastic Teflon Pump type: Peristaltic Submersible <b>Micro-purge</b> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
20.050 m	(-) _____ m	(=) _____ m							
Water Column			(x) Conversion Factor	(=) Litres per 1 Well Volume					
_____ m			(x) _____	(=) _____					
Depth to product: _____ m	Product Thickness: _____ m		Verified with Bailer: <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N						

Water Quality Parameters								
Beginning purge time:			Ending purge time:				Pump Intake Depth (mbtoc):	
Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
*pH, temp, cond readings not necessary if well is purged dry								Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth
Well dry, did not sample.								

_____	Total Well Volume	Sample time _____	Containers used _____
_____	Actual amount of water prior to sampling		
_____	Flow rate mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/> NA	Was the well dry purged? <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/> NA
Duplicate sample collected?	<input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N
Rinsate blank collected?	<input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N
Duplicate sample ID	_____
Rinsate blank ID	_____





# Groundwater - Well Sampling Data Form

Job Information	
Date: 31/10/13	Time: arrive 15:35 depart 16:40
Project Name: Symphony	Project Number: 0207432
Site Location: MH. Piper	Sampler: D. Brookes
Well ID: MI-X-5/08	Weather: Fml

Equipment	
Water quality equipment description: Y81	Interface probe number: 54D 3894
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible <u>Micro-purge</u> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
13.803 m	(-) 10.197 m	(=) 3.6 m							
Water Column (x) Conversion Factor (=) Litres per 1 Well Volume									
3.6 m (x) 1.96 (=) ~7.2 L									
Depth to product: _____ m	Product Thickness: _____ m	Verified with Bailer: <input checked="" type="checkbox"/> <input type="checkbox"/>							

Water Quality Parameters									
Beginning purge time:			Ending purge time:				Pump Intake Depth (mbtoc):		
Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments	
0.2	16:08	5.66	20.1	751	0.04	149.6	10.226	Slightly cloudy, no odour, light brown	
0.8	16:11	5.61	19.0	732	0.06	161.2	10.240		
1.4	16:14	5.58	18.7	724	0.45	175.9	10.288	Clear, colourless, no odour.	
2.0	16:17	5.57	18.7	719	0.22	184.5	10.327		
2.6	16:20	5.57	18.7	718	0.20	185.5	10.368		
3.2	16:23	5.57	18.7	717	0.26	186.6	10.387		
3.8	16:26	5.57	18.7	716	0.21	187.9	10.402		
*pH, temp, cond readings not necessary if well is purged dry						Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth			
3.8	Total Well Volume			Actual amount of water prior to sampling		Sample time	16:26	Containers used	6
200	Flow rate			mL/minute		Did field parameters stabilise?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Rinsate blank collected?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Duplicate sample ID _____ Rinsate blank ID _____	

Metals, TRH, BTEX, PAH, Phenols, Cations/Anions, VOC suite, PCB





# Groundwater - Well Sampling Data Form

Job Information	
Date: <u>17.12.13</u>	Time: arrive <u>0815</u> depart <u>1000</u>
Project Name: <u>Phase II ESA - Mt Piper</u>	Project Number: <u>0207423</u>
Site Location: <u>Mt Piper Power Station</u>	Sampler: <u>C. Ford</u>
Well ID: <u>MH-MW01</u>	Weather: <u>Fine</u>

Equipment	
Water quality equipment description: <u>YSI Pro Plus</u>	Interface probe number: <u>Airmet 23973</u>
Purging equipment: (please circle)	Bailer type: <u>Plastic</u> <u>Teflon</u>
	Pump type: <u>Peristaltic</u> <u>Submersible</u> <u>Micro-purge</u> <u>Amazon</u> <u>Other:</u>

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	<u>50mm</u>	100mm	125mm	150mm	200mm	250mm	300mm	<b>Volume of water in well / V</b> = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	<u>1.96</u>	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
<u>28.90</u> m	(-) <u>23.78</u> m	(=) <u>5.12</u> m							
			Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume				
			<u>5.12</u> m	(x) <u>1.96</u>	(=) <u>10.0</u> L				
Depth to product: <u>-</u> m		Product Thickness: <u>-</u> m		Verified with Bailer: <input type="checkbox"/> Y <input checked="" type="checkbox"/> N					

Water Quality Parameters								
Beginning purge time: <u>0825</u>		Ending purge time: <u>0930</u>			Pump Intake Depth (mbtoc): <u>25</u>			
Litres	Time	PH	Temp °C	Cond $\mu$ S/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.1	0853	6.00	19.2	1805	0.14	122.6	23.890	Slightly Silty, no odour or screen
0.5	0902	5.94	18.4	1824	0.14	125.1	23.890	Silty, no odour or screen
1.0	0907	5.90	17.6	1782	0.15	126.0	23.890	Same as above
1.5	0912	5.89	17.6	1778	0.15	125.8	23.890	Clear, no odour or screen
2.0	0917	5.89	17.6	1778	0.16	124.9	23.890	Same as above
2.5	0922	5.89	17.7	1778	0.16	124.5	23.891	Same as above
3.0	0926	5.89	17.7	1776	0.16	124.4	23.891	Same as above
3.5	0930	5.89	17.6	1778	0.17	123.2	23.891	Same as above

\*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

<u>3.5</u>	<b>Total Well Volume</b> Actual amount of water prior to sampling	Sample time <u>0930</u>	Containers used <u>6</u>
<u>100</u>	<b>Flow rate</b> mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N
Rinsate blank collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N

Fill : 60s → 45s  
 Discharge : 25s → 30s  
 Duplicate sample ID DOI-17213CF  
TOI-17213CF  
 Rinsate blank ID -

Well gauged from ground level needs to be adjusted to POC with surveying data





# Groundwater - Well Sampling Data Form

Job Information	
Date: 16.12.13	Time: arrive 1400 depart 1550
Project Name: Phase II ESA - Mt Piper	Project Number: 0207423
Site Location: Mt Piper ESA Power Station	Sampler: C. Ford
Well ID: MH-MW02	Weather: Fine

Equipment	
Water quality equipment description: <del>Amprobe</del> YSI Pro Plus	Interface probe number: Armet 23973
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible <u>Micro-purge</u> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
14.701 m	(-) 11.551 m	(=) 3.15 m							
Water Column		(x) Conversion Factor	(=) Litres per 1 Well Volume						
3.15 m		(x) 1.96	(=) 6.174 L						
Depth to product:	Product Thickness:		Verified with Bailer:		<input type="checkbox"/> Y <input checked="" type="checkbox"/> N				

Water Quality Parameters									
Beginning purge time: 1422		Ending purge time: 1523			Pump Intake Depth (mbtoc): Bmbg/1				
Litres	Time	PH	Temp °C	Cond $\mu$ S/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments	
0.1	1428	6.60	23.5	288.7	0.16	11.5	11.64	Clear, no odour or sheen	
0.5	1433	6.12	19.5	257.8	0.17	20.1	11.69	Same as above	
1.0	1438	6.13	18.9	251.8	0.18	2.4	11.78	Same as above	
1.5	1444	6.17	19.7	252.2	0.19	0.8	11.781	Same as above	
2.0	1450	6.11	19.3	244.4	0.21	7.4	11.801	Same as above	
2.5	1457	6.09	18.2	237.7	0.23	-1.8	11.811	Same as above	
3.0	1505	6.08	17.9	230.0	0.21	-6.8	11.822	Same as above	
3.5	1511	6.08	17.8	226.1	0.22	-7.0	11.861	Same as above	
4.0	1517	6.05	17.5	221.5	0.22	-9.4	11.862	Same as above	
4.5	1523	6.06	17.7	220.6	0.20	-13.0	11.861	Same as above	
*pH, temp, cond readings not necessary if well is purged dry						Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth			
45	Total Well Volume		Actual amount of water prior to sampling		Sample time: 1523		Containers used: 6		
100	Flow rate		mL/minute		Did field parameters stabilise?		Was the well dry purged?		
				<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA		<input type="checkbox"/> Y <input checked="" type="checkbox"/> N			

Field QC Checks				
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N		
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N		
Was documentation of equipment conducted?	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> NA	
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N	<input type="checkbox"/> NA	
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> NA	
Duplicate sample collected?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	Duplicate sample ID: D01-161213CF	
Rinsate blank collected?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N	Rinsate blank ID: NA	

Fill: 60s  
Discharge: 10s





# Groundwater - Well Sampling Data Form

Job Information	
Date: 17.12.13	Time: arrive 1015 depart 1130
Project Name: Phase II ESA - Mt Piper	Project Number: 0207423
Site Location: Mt Piper	Sampler: Chris Ford
Well ID: MH-MW03	Weather: Fine

Equipment	
Water quality equipment description: VSI Pro Plus	Interface probe number: Armet 23973
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible <u>Micro-purge</u> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
22.67 m	(-) 18.708 m	(=) 3.962 m							
Water Column		(x) Conversion Factor	(=) Litres per 1 Well Volume						
3.962 m		(x) 1.96	(=) 7.76 L						
Depth to product:	Product Thickness:		Verified with Bailer:						
			Y <input checked="" type="radio"/> N <input type="radio"/>						

Water Quality Parameters								
Beginning purge time: 1032			Ending purge time: 1114			Pump Intake Depth (mbtoc): 21.5		
Litres	Time	PH	Temp °C	Cond µS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.1	1040	6.08	20.8	2921	0.20	26.7	18.732	Silty, no odour or streen
0.5	1044	5.94	19.3	3310	0.19	57.6	18.733	Same as above
1.0	1050	5.87	19.4	3329	0.20	57.7	18.731	Same as above
1.5	1055	5.82	18.6	3325	0.22	59.4	18.732	Same as above
2.0	1058	5.81	18.7	3342	0.23	59.2	18.731	Same as above
2.5	1102	5.80	18.6	3373	0.24	60.0	18.733	Same as above
3.0	1106	5.79	18.5	3412	0.24	60.6	18.735	Same as above
3.5	1110	5.79	18.5	3444	0.26	61.2	18.735	Same as above
3.75	1112	5.79	18.5	3443	0.27	61.8	18.734	Same as above
4.0	1114	5.79	18.5	3447	0.28	61.9	18.732	Same as above

\*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

4.00	Total Well Volume Actual amount of water prior to sampling	Sample time: 1114	Containers used: 6
125	Flow rate mL/minute	Did field parameters stabilise? <input checked="" type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA	Was the well dry purged? <input type="radio"/> Y <input checked="" type="radio"/> N

Field QC Checks		
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="radio"/> Y	<input type="radio"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="radio"/> Y	<input type="radio"/> N
Was documentation of equipment conducted?	<input checked="" type="radio"/> Y	<input type="radio"/> N <input type="radio"/> NA
Were air bubbles present in vials at time of collection?	<input type="radio"/> Y	<input checked="" type="radio"/> N <input type="radio"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="radio"/> Y	<input type="radio"/> N <input type="radio"/> NA
Duplicate sample collected?	<input type="radio"/> Y	<input checked="" type="radio"/> N <input type="radio"/> NA
Rinsate blank collected?	<input type="radio"/> Y	<input checked="" type="radio"/> N <input type="radio"/> NA

Discharge: 20s  
Fill: 8 45s

Duplicate sample ID: \_\_\_\_\_  
Rinsate blank ID: \_\_\_\_\_





# Groundwater - Well Sampling Data Form

Job Information	
Date: 18/12/13	Time: arrive 16:00 depart 16:40
Project Name: Symphony	Project Number: 0207420
Site Location: W of Mt Piper	Sampler: D. Brooks
Well ID: MH-X-4/08	Weather: Fine

Equipment	
Water quality equipment description: Y31	Interface probe number: MIM-199
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible Micro-purge Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
12.000 m	(-) 2.375 m	(=) ~10 m							
Water Column (x) Conversion Factor (=) Litres per 1 Well Volume									
~10 m (x) 1.96 (=) ~19.6 L									
Depth to product: _____ m	Product Thickness: _____ m	Verified with Bailer: <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N							

Water Quality Parameters								
Beginning purge time:		Ending purge time:				Pump Intake Depth (mbtoc):		
Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.2	16:07	5.62	16.4	972	3.18	170.2	2.389	Clear, colourless, no odour.
0.8	16:10	5.55	16.2	970	0.67	172.9	2.394	" "
1.4	16:13	5.54	16.3	974	0.52	173.1	2.398	" "
2.0	16:16	5.53	16.8	986	0.55	172.8	2.405	" "
2.6	16:19	5.53	17.2	996	0.48	172.8	2.411	" "
3.2	16:22	5.53	17.4	1000	0.47	172.7	2.415	" "
*pH, temp, cond readings not necessary if well is purged dry								
Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth								

3.2	Total Well Volume	Sample time 16:22	Containers used 6
200	Actual amount of water prior to sampling	Flow rate 41/200 mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
			Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Rinsate blank collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Duplicate sample ID	_____
Rinsate blank ID	_____



# Groundwater - Well Sampling Data Form

Job Information	
Date: <u>6/11/13</u>	Time: arrive <u>11:40</u> depart <u>12:25</u>
Project Name: <u>Symphony stage 2</u>	Project Number: <u>0207423</u>
Site Location: <u>UMH Piper</u>	Sampler: <u>D Brookes / S Holloman</u>
Well ID: <u>MH-X-D15</u>	Weather: <u>Fine</u>

Equipment	
Water quality equipment description: <u>YSI</u>	Interface probe number: <u>SPD 3984 60m</u>
Purging equipment: (please circle)	Bailer type: <u>Plastic</u> <u>Teflon</u> Pump type: <u>Peristaltic</u> <u>Submersible</u> <u>Micro-purge</u> <u>Amazon</u> <u>Other:</u>

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Total Well Depth	(-) Water level	(=) Water Column							
<u>29.300</u> m	(-) <u>26.625</u> m	(=) <u>2.675</u> m							
Water Column		(x) Conversion Factor	(=) Litres per 1 Well Volume						
<u>2.675</u> m		(x) <u>1.96</u>	(=) <u>5.350</u> L						
Depth to product: <u>—</u> m	Product Thickness: <u>—</u> m	Verified with Bailer: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N							

Water Quality Parameters								
Beginning purge time: <u>11:45</u>			Ending purge time: <u>12:16</u>			Pump Intake Depth (mbtd): <u>28.800</u>		
Litres	Time	PH	Temp °C	Cond µS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.5	11:56	4.31	27.0	2286	0.08	259.2	/	very turbid, black, floating sediment, no odour
1.0	12:00	4.29	26.3	2225	0.09	244.3	/	" " "
1.5	12:04	4.25	25.1	2208	0.15	251.9	/	" " "
2.0	12:08	4.09	24.7	2224	0.14	279.3	/	" " "
2.5	12:12	4.18	24.5	2207	0.16	262.1	/	" " "
3.0	12:16	4.24	24.5	2190	0.47	250.2	/	sheen, " " " organic salt odour
								Drawdown not available IP detecting faulty SWL.
*pH, temp, cond readings not necessary if well is purged dry						Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth		

<u>5.350</u>	Total Well Volume Actual amount of water prior to sampling	Sample time <u>12:17</u>	Containers used <u>6</u>
<u>200</u>	Flow rate mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Rinsate blank collected?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Metals, TRH, BTEX, PAH, Phenols, cations / anions	
Duplicate sample ID	_____
Rinsate blank ID	_____





# Groundwater - Well Sampling Data Form

Job Information	
Date: 8/11/13	Time: arrive 08:30 depart 11:00
Project Name: Symphony stage 2	Project Number: 0207423
Site Location: UMT Piper	Sampler: S. Holloman / D Brookes
Well ID: MH-X-D17	Weather: fine

Equipment	
Water quality equipment description: YSI	Interface probe number: SYD 3985 30m
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible <b>Micro-purge</b> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
34.255 m	(-) 26.711 m	(=) 7.544 m							
			Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume				
			7.544 m	(x) 1.96	(=) 15.088 L				
Depth to product: — m		Product Thickness: — m		Verified with Bailer: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N					

Water Quality Parameters								
Beginning purge time: 09:05			Ending purge time:			Pump Intake Depth (m) 33.755		
Litres	Time	PH	Temp °C	Cond µS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.2	09:46	6.93	34.8	1606	0.02	104.3	/	very turbid, grey, no odour
0.8	09:49	6.95	34.1	1527	0.05	-90.3	/	" " "
1.4	09:52	6.79	31.7	1596	0.06	-35.1	/	" " "
2.0	09:55	6.75	31.4	1620	0.04	-17.6	/	" " "
2.5	09:58	6.72	32.0	1644	0.03	-5.6	/	" " "
2.9	09:01	6.66	32.8	1661	0.02	6.8	/	" " "
3.3	10:04	6.60	32.9	1659	0.02	-2.4	/	" " "
*pH, temp, cond readings not necessary if well is purged dry						Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth		

15.088	Total Well Volume Actual amount of water prior to sampling	Sample time 10:05	Containers used 18
200	Flow rate mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input type="checkbox"/> Y <input type="checkbox"/> N

Field QC Checks			
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> NA
Duplicate sample collected?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	Duplicate sample ID T01-GW-081113
Rinsate blank collected?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	D04-GW-081113



# Groundwater - Well Sampling Data Form

Job Information	
Date: <u>6/11/13</u>	Time: arrive <u>14:00</u> depart <u>15:00</u>
Project Name: <u>Symphony Stage 2</u>	Project Number: <u>0207423</u>
Site Location: <u>Mt. Piper</u>	Sampler: <u>D Brookes / S Holloman</u>
Well ID: <u>MH-X-D18</u>	Weather: <u>Fine</u>

Equipment	
Water quality equipment description: <u>YSI</u>	Interface probe number: <u>SYD 3984 60m</u>
Purging equipment: (please circle)	Bailer type: <u>Plastic</u> Teflon
	Pump type: <u>Peristaltic</u> <u>Submersible</u> <u>Micro-purge</u> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
<u>43.500</u> m	<u>21.000</u> m	<u>22.500</u> m							
Water Column		(x) Conversion Factor	(=) Litres per 1 Well Volume						
<u>22.500</u> m		<u>1.96</u>	<u>45.000</u> L						
Depth to product: <u>—</u> m	Product Thickness: <u>—</u> m	Verified with Bailer:	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N					

Water Quality Parameters								
Beginning purge time: <u>14:17</u>			Ending purge time: <u>14:51</u>			Pump Intake Depth (mbtoc): <u>40.000</u>		
Litres	Time	PH	Temp °C	Cond µS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.2	14:31	6.99	26.8	750	0.06	-125.3	/	slightly cloudy, no odour
1.0	14:35	6.90	24.6	681	0.07	-104.5	/	" "
1.8	14:39	7.03	24.0	672	0.05	-156.4	/	grey, turbid, <del>no odour</del> strong odour
2.6	14:43	7.00	23.9	677	0.06	-119.1	/	" " smells like gas / oil odour
3.4	14:47	6.92	21.7	646	0.06	-119.1	/	" " "
4.2	14:51	6.91	21.4	633	0.07	-126.7	/	" " "
								Drawdown not available If detecting faulty SWL:
*pH, temp, cond readings not necessary if well is purged dry						Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth		
<u>45.000</u>	Total Well Volume		Actual amount of water prior to sampling		Sample time <u>14:52</u>		Containers used <u>6</u>	
<u>200</u>	Flow rate		mL/minute		Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA		Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N	

Field QC Checks		
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Rinsate blank collected?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
		Duplicate sample ID <u>—</u>
		Rinsate blank ID <u>RB-GWT-06/11/13</u>



# Groundwater - Well Sampling Data Form

Job Information	
Date: 8/11/13	Time: arrive 11:15 depart 12:15
Project Name: Symphony stage 2	Project Number: 0207423
Site Location: Mt. Piper	Sampler: S. Holloman / D Brookes
Well ID: MH-X-D19	Weather: Fine / overcast

Equipment	
Water quality equipment description: YSI	Interface probe number: SYD 3985 30M
Purging equipment: (please circle)	Bailer type: Plastic Teflon Pump type: Peristaltic Submersible <b>Micro-purge</b> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
13.009 m	(-) 1.906 m	(=) 6.903 m							
Water Column		(x) Conversion Factor	(=) Litres per 1 Well Volume						
6.903 m		(x) 1.96	(=) 13.806 L						
Depth to product: _____ m	Product Thickness: _____ m	Verified with Bailer: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N							

Water Quality Parameters								
Beginning purge time: 11:44			Ending purge time: 12:03			Pump Intake Depth (mbtoc):		
Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.2	11:45	6.53	21.4	3044	0.61	-27.8	7.962	Clear, light brown, no odour.
0.8	11:48	6.08	18.9	3516	0.11	4.8	7.965	" "
1.4	11:51	6.00	18.9	3606	0.67	9.0	7.965	" "
2.0	11:54	5.97	18.6	3628	0.80	11.5	7.965	" "
2.6	11:57	5.96	18.5	3661	0.91	13.7	7.965	" "
3.2	12:00	5.94	18.7	3723	1.03	16.5	7.965	" "
3.8	12:03	5.93	18.8	3753	0.96	18.1	7.965	Clear, colourless, no odour.
*pH, temp, cond readings not necessary if well is purged dry						Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth		
13.806	Total Well Volume		Actual amount of water prior to sampling		Sample time 12:04		Containers used 6	
200	Flow rate mL/minute		Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA		Was the well dry purged? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N			

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Rinsate blank collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Duplicate sample ID _____	
Rinsate blank ID _____	





# Groundwater - Well Sampling Data Form

Job Information	
Date: 31/10/13	Time: arrive 16:50 depart 18:00
Project Name: Symphony Stage 2	Project Number: 0207423
Site Location: M4 Piper	Sampler: S. Holloman
Well ID: M1-X-5/D2	Weather: Fine

Equipment	
Water quality equipment description: YSI	Interface probe number: SYD 3985 30M
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible <b>Micro-purge</b> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V $= Pr \times r \times h$ V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
13.825 m	(-) 12.105 m	(=) 1.720 m							
Water Column		(x) Conversion Factor	(=) Litres per 1 Well Volume						
1.720 m		(x) 1.96	(=) 3.440 L						
Depth to product:	Product Thickness:		Verified with Bailer:		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N				

Water Quality Parameters									
Beginning purge time: 17:18		Ending purge time: 17:39		Pump Intake Depth (mbtoc) 3.325					
Litres	Time	PH	Temp °C	Cond µS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments	
0.2	17:19	5.57	20.5	1125	3.14	40.4	12.110	Slightly cloudy, no odour	
1.0	17:23	5.47	18.6	1131	1.44	53.5	12.110	"	
1.8	17:27	5.47	18.2	1131	0.46	65.1	12.110	"	
2.6	17:31	5.49	18.0	1133	0.54	71.1	12.110	"	
3.4	17:35	5.54	18.0	1121	0.62	73.2	12.110	"	
4.2	17:39	5.55	18.1	1114	0.63	72.0	12.110	"	
*pH, temp, cond readings not necessary if well is purged dry				Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth					
3.440	Total Well Volume		Actual amount of water prior to sampling		Sample time 17:40		Containers used 6		
200	Flow rate mL/minute		Did field parameters stabilise?		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA		Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N		

Field QC Checks		
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Rinsate blank collected?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Duplicate sample ID		_____
Rinsate blank ID		RB-GW3-311013

Metals, TRH, BTEX, PAH, Phenols, Cations / Anions, VOC Suite, PCB

where was this located?

MI-X-5/D2? <sup>already</sup> ~~sample~~ ~~form~~ ~~for~~ ~~the~~ ~~100~~



# Groundwater - Well Sampling Data Form

Job Information	
Date: 5/11/13	Time: arrive 15:45 depart 15:50
Project Name: Symphony Stage 2	Project Number: 0207423
Site Location: Mt. Piper	Sampler: S. Holloman
Well ID: 5/D12	Weather: Fine.

Equipment	
Water quality equipment description: <del>✓</del>	Interface probe number: SPD 3985 30M
Purging equipment: (please circle)	Bailer type: Plastic Teflon Pump type: Peristaltic Submersible Micro-purge Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth (-) Water level (=) Water Column	7.586 m (-) 3.677 m (=) 3.909 m Water Column (x) Conversion Factor (=) Litres per 1 Well Volume 3.909 m (x) 1.96 (=) 7.818 L								
Depth to product: _____ m	Product Thickness: _____ m	Verified with Bailer: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N							

Water Quality Parameters									
Beginning purge time:			Ending purge time:				Pump Intake Depth (mbtoc):		
Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments	
<i>gauging data only</i>									
*pH, temp, cond readings not necessary if well is purged dry									
Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth									

Total Well Volume Actual amount of water prior to sampling	Sample time	Containers used
Flow rate mL/minute	Did field parameters stabilise? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input type="checkbox"/> Y <input type="checkbox"/> N

Field QC Checks		
Was pre-cleaned sampling equipment used for these samples?	<input type="checkbox"/> Y <input type="checkbox"/> N	
Was pre-cleaning sampling equipment properly protected from contamination?	<input type="checkbox"/> Y <input type="checkbox"/> N	
Was documentation of equipment conducted?	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	
Was sample for metals field filtered prior to preservations?	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	
Duplicate sample collected?	<input type="checkbox"/> Y <input type="checkbox"/> N	Duplicate sample ID _____
Rinsate blank collected?	<input type="checkbox"/> Y <input type="checkbox"/> N	Rinsate blank ID _____





# Groundwater - Well Sampling Data Form

Job Information	
Date: 31/10/13	Time: arrive 15:00 depart 16:35
Project Name: Symphony stage 2	Project Number: 0207423
Site Location: Mt. Piper	Sampler: S. Holloman
Well ID: M1-X-5/D23 (Beneath cap 5/3)	Weather: Fine

Equipment	
Water quality equipment description: YSI	Interface probe number: SYD 3985 30M
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible <b>Micro-purge</b> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
16.895 m	11.560 m	5.335 m							
	Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume						
	5.335 m	1.96	10.670 L						
Depth to product: — m	Product Thickness: — m	Verified with Bailer: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N							

Water Quality Parameters								
Beginning purge time: 15:59			Ending purge time: 16:21			Pump Intake Depth (mbtoc): 16.395		
Litres	Time	PH	Temp °C	Cond µS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.8	16:00	5.93	17.4	798	0.52	21.9	11.570	Brown, turbid, no odour
1.6	16:03	5.92	17.5	799	0.45	27.1	11.570	yellow, clear, no odour
2.4	16:06	5.94	18.5	812	0.40	33.2	11.570	" " "
3.2	16:09	5.93	18.5	817	0.50	34.5	11.570	clear, no odour
4.0	16:12	5.94	18.2	819	0.57	35.2	11.570	" "
4.8	16:15	5.94	18.2	822	0.57	35.2	11.570	" "
5.6	16:18	5.93	18.0	824	0.55	35.4	11.570	" "
6.4	16:21	5.94	17.9	829	0.54	33.9	11.570	" "

\*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

10.670	<b>Total Well Volume</b> Actual amount of water prior to sampling	Sample time 16:22	Containers used 6
200	<b>Flow rate</b> mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Rinsate blank collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N

Metals, TRH, BTEX, PAH, Phenols, Cations / Anions, VOC suite, PCB

Duplicate sample ID \_\_\_\_\_

Rinsate blank ID \_\_\_\_\_







# Groundwater - Well Sampling Data Form

Job Information	
Date: 31/10/13	Time: arrive 15:20 depart 15:30
Project Name: Symphony	Project Number: 0707432
Site Location: Mt. Piper	Sampler: D. Brookes
Well ID: MI-X-5/07	Weather: Fine

Equipment	
Water quality equipment description: YSI	Interface probe number: 3894
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible <b>Micro-purge</b> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = $\pi r^2 \times h$ V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
20.050 m	(-) _____ m	(=) _____ m							
		Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume					
		_____ m	(x) _____	(=) _____					
Depth to product: _____ m	Product Thickness: _____ m		Verified with Bailer: <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N						

Water Quality Parameters									
Beginning purge time:			Ending purge time:				Pump Intake Depth (mbtoc):		
Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments	
<del>               *pH, temp, cond readings not necessary if well is purged dry                Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth             </del>								Well dry, did not sample.	
Total Well Volume			Actual amount of water prior to sampling		Sample time _____		Containers used _____		
Flow rate			mL/minute		Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/> NA		Was the well dry purged? <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N		

Field QC Checks		
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y	<input checked="" type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y	<input checked="" type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y	<input checked="" type="checkbox"/> N <input checked="" type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input checked="" type="checkbox"/> Y	<input checked="" type="checkbox"/> N <input checked="" type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y	<input checked="" type="checkbox"/> N <input checked="" type="checkbox"/> NA
Duplicate sample collected?	<input checked="" type="checkbox"/> Y	<input checked="" type="checkbox"/> N
Rinsate blank collected?	<input checked="" type="checkbox"/> Y	<input checked="" type="checkbox"/> N
Duplicate sample ID		_____
Rinsate blank ID		_____



# Groundwater - Well Sampling Data Form

Job Information	
Date: 31/10/13	Time: arrive 15:35 depart 16:40
Project Name: Symphony	Project Number: 0207432
Site Location: Mt. Piper	Sampler: D. Brookes
Well ID: MI-X-5/08	Weather: Fine

Equipment	
Water quality equipment description: <u>781</u>	Interface probe number: <u>540 3894</u>
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible <u>Micro-purge</u> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	<u>50mm</u>	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
<u>13.803</u> m	(-) <u>10.197</u> m	(=) <u>3.6</u> m							
			Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume				
			<u>3.6</u> m	(x) <u>1.96</u>	(=) <u>~7.2</u> L				
Depth to product: _____ m		Product Thickness: _____ m		Verified with Bailer: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N					

Water Quality Parameters									
Beginning purge time:			Ending purge time:				Pump Intake Depth (mbtoc):		
Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments	
0.2	16:08	5.66	20.1	751	0.04	149.6	10.226	Slightly cloudy, no colour, light brown	
0.8	16:11	5.61	19.0	732	0.06	161.2	10.240		
1.4	16:14	5.58	18.7	724	0.45	175.9	10.288	Clear, colourless, no odour.	
2.0	16:17	5.57	18.7	719	0.22	184.5	10.327		
2.6	16:20	5.57	18.7	718	0.20	185.5	10.368		
3.2	16:23	5.57	18.7	717	0.26	186.6	10.387		
3.8	16:26	5.57	18.7	716	0.21	187.9	10.402		
*pH, temp, cond readings not necessary if well is purged dry						Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth			
3.8	Total Well Volume		Actual amount of water prior to sampling		Sample time		Containers used		
200					16:26		6		
Flow rate mL/minute		Did field parameters stabilise?			Was the well dry purged?				
		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA			<input checked="" type="checkbox"/> Y <input type="checkbox"/> N				

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Rinsate blank collected?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Duplicate sample ID _____ Rinsate blank ID _____	

Metals, TRH, BTEX, PAH,  
 Phenols, Cations / Anions,  
 VOC suite, PCB





# Groundwater - Well Sampling Data Form

Job Information	
Date: 19/12/13	Time: arrive 0900 depart 1000
Project Name: symphony	Project Number: 0207423
Site Location: WKE Piper	Sampler: ST
Well ID: MP GM 5/05	Weather: Fine

Equipment	
Water quality equipment description:	Interface probe number:
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible <u>Micro-purge</u> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
10.920 m	(-) 6.845 m	(=) 4.075 m							
	Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume						
	4.075 m	(x) 7.85	(=) 32.0 L						
Depth to product:	- m	Product Thickness:	- m	Verified with Bailer:	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N				

Water Quality Parameters								
Beginning purge time: 0920			Ending purge time: 0926			Pump Intake Depth (mbtoc): 8.50 m bto c		
Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
1	0921	6.40	17.0	1462	1.86	122.9	6.97	pale brown, med turb, no odour
2	0922	6.32	17.0	1463	1.32	111.2	7.06	" low turb
3	0923	6.30	17.8	1476	1.42	104.1	7.14	"
4	0924	6.29	17.7	1481	1.53	97.7	7.21	clear water
5	0925	6.29	17.6	1484	1.83	93.5	7.28	"
6	0926	6.28	17.7	1491	1.93	91.1	7.32	"

\*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

6L	<b>Total Well Volume</b> Actual amount of water prior to sampling	Sample time: 0940	Containers used: 8
1000	<b>Flow rate</b> mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N Duplicate sample ID: _____
Rinsate blank collected?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N Rinsate blank ID: _____



# Groundwater - Well Sampling Data Form

Job Information	
Date: <b>3-10-13</b>	Time: arrive _____ depart _____
Project Name: <b>Project Symphony</b>	Project Number: <b>0207243</b>
Site Location: <b>Store/Bowser - Mt Piper</b>	Sampler: <b>T-Shaw</b>
Well ID: <b>MWMP01</b>	Weather: <b>rain</b>

Equipment	
Water quality equipment description: <b>YSI Pro Plus (BC100782)</b> interface probe number: <b>Geotech</b>	
Purging equipment: (please circle)	Bailer type: <b>Plastic</b> <b>Teflon</b> Pump type: <b>Peristaltic</b> <b>Submersible</b> <b>Micro-purge</b> <b>Amazon</b> <b>Other:</b>

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = $\pi r^2 \times h$ V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
<b>3.970</b> m	(-) <b>0.653</b> m	(=) <b>3.317</b> m							
			Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume				
			<b>3.32</b> m	(x) <b>2</b>	(=) <b>6.64</b> L				
Depth to product: _____ m		Product Thickness: _____ m		Verified with Bailer: <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N					

Water Quality Parameters									
Beginning purge time:			Ending purge time:				Pump Intake Depth (mbtoc):		
Litres	Time	PH	Temp °C	Cond $\mu\text{S/cm}$	DO mg/L	Redox mV	Drawdown <10cm	Comments	
0.5	1:06	6.68	23.0	195.6	2.34	-17.5	—	Brown, cloudy, no odour	
0.6	1:09	6.60	22.4	196.4	2.42	-19.7	—		
0.9	1:12	6.58	21.0	189.1	2.78	-20.6	—		
1.2	1:15	6.48	20.3	185.7	2.67	-16.4	—		
1.5	1:18	6.38	20.3	184.9	2.80	-13.7	—		
1.8	1:21	6.37	19.8	184.0	2.93	-14.7	—	Post <del>test</del> sampling	
2.2	1:24	6.32	19.7	181.9	3.06	-10.9	—	Temp. 24.6 pH 6.40	
2.5	1:27	6.33	19.6	181.4	3.04	-8.8	—	DO: 3.89 Redox -19.2	
2.8	1:30	6.29	19.4	180.4	3.17	-5.2	—	Cond. 200.7	
→ Pump stoppered working. fixed parameters taken @ 3:16 turbid.									
3.8	2:20	*pH, temp, cond readings not necessary if well is purged dry			Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth				
2.8L	Total Well Volume			Sample time		Containers used			
100	Actual amount of water prior to sampling			11:20am					
Flow rate mL/minute			Did field parameters stabilise?		Was the well dry purged?				
			<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N				

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Was duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Was blank collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Duplicate sample ID <input checked="" type="checkbox"/>	
Rinsate blank ID <input checked="" type="checkbox"/>	



# Groundwater - Well Sampling Data Form

Job Information	
Date: 3/10/13	Time: arrive 0700 depart 1530
Project Name: Mt. Piper (Symphony)	Project Number: 0207243
Site Location: Mt. Piper	Sampler: GP
Well ID: MWMP02	Weather: Cool, patchy clouds

Equipment	
Water quality equipment description: YSL # 156100782	Interface probe number: Geotech # 4310
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible <u>Micro-purge</u> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
6.800 m	(-) 2.530 m	(=) ~4 m							
Water Column		(x) Conversion Factor	(=) Litres per 1 Well Volume						
4 m		(x) ~2	(=) 8						
Depth to product: NA m	Product Thickness: — m	Verified with Bailer: <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N							

Water Quality Parameters								
Beginning purge time: 0156			Ending purge time: 1422			Pump Intake Depth (mbtoc): ~5.5		
Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.5	1358	6.05	20.8	272.3	2.04	3.7	—	grey, turbid, no odour
1.5	1401	6.16	20.8	275.8	0.11	-6.1	—	as above
2.5	1404	6.05	20.9	264.8	0.15	2.7	2.880	as above, becoming clear
3.5	1407	5.91	20.9	267.0	0.23	21.1	2.880	as above, slightly cloudy, ddown stable
5.0	1412	5.55	21.0	276.5	0.19	40.1	2.900	as above, draw down stable
6.0	1415	5.79	21.1	279.5	0.17	32.0	2.900	" "
7.5	1419	5.80	21.0	282.1	0.16	31.0	—	" "
8.5	1422	5.79	20.9	280.4	0.15	28.8	—	
Screened interval 7-4mbgt								

\*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

—	Total Well Volume Actual amount of water prior to sampling	Sample time 1425	Containers used 5
~330	Flow rate mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Rinsate blank collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Duplicate sample ID	_____
Rinsate blank ID	_____





# Groundwater - Well Sampling Data Form

Job Information	
Date: 2.10.13	Time: arrive 0700 depart 1530
Project Name: Mt Piper (Symphony) - GME	Project Number: 0207243
Site Location: Mt Piper	Sampler: R. Pascoe
Well ID: MWMP03	Weather: overcast windy

Equipment	
Water quality equipment description: YSI-13C100782	Interface probe number: Geotech - 4310
Purging equipment: (please circle)	Bailer type: Plastic Teflon Pump type: Peristaltic Submersible <b>Micro-purge</b> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth (-) Water level (=) Water Column	3.640 m (-) 1.121 m (=) 2.519 m								
Water Column (x) Conversion Factor (=) Litres per 1 Well Volume	2.519 m (x) 1.96 (=) ~3 L								
Depth to product: _____ m	Product Thickness: _____ m	Verified with Bailer: <input type="checkbox"/> Y <input checked="" type="checkbox"/> N							

Water Quality Parameters									
Beginning purge time: 0156			Ending purge time: 1432			Pump Intake Depth (mbtoc): ~2.5			
Litres	Time	PH	Temp °C	Cond µS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments	
1	1410	6.43	15.6	123.5	1.14	-26.0	-	Grey, turbid, no odour, screen	
2.0	1414	6.45	18.3	173.1	1.47	-36.1	-	" " "	
3.0	1418	6.49	18.2	177.8	1.72	-39.9	-	" " no screen.	
4.0	1421	6.51	18.0	116.6	1.02	-55.8	-	Cloudy, grey, no odour, no screen	
5.0	1424	6.44	17.7	119.9	1.21	-74.9	-		
6.0	1428	6.33	17.7	116.4	1.06	-76.1	-		
7.0	1431	6.44	17.8	117.3	0.97	-80.1	-		
								Screened interval 4-1mbgl	
*pH, temp, cond readings not necessary if well is purged dry						Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth			
Total Well Volume Actual amount of water prior to sampling		Sample time: 1440		Containers used: 5 bottles					
~330		Flow rate mL/minute		Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA		Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N			

Field QC Checks			
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N	<input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N	
Rinsate blank collected?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N	
Duplicate sample ID		_____	
Rinsate blank ID		_____	



# Groundwater - Well Sampling Data Form

Job Information	
Date: <u>31/10/13</u>	Time: arrive <u>10:30</u> depart <u>11:20</u>
Project Name: <u>Symphony stage 2</u>	Project Number: <u>0207423</u>
Site Location: <u>Mt. Piper</u>	Sampler: <u>S. Holloman</u>
Well ID: <u>MJ-X-mwmp4</u>	Weather: <u>Fine</u>

Equipment	
Water quality equipment description: <u>YSI</u>	Interface probe number: <u>SYD 3895 30m.</u>
Purging equipment: (please circle)	Bailer type: <u>Plastic</u> Teflon Pump type: <u>Peristaltic</u> Submersible <u>Micro-purge</u> Amazon      Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	<u>50mm</u>	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = $P \times r \times h$ V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	<u>1.96</u>	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
<u>4.041</u> m	(-) <u>1.958</u> m	(=) <u>2.083</u> m							
			Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume				
			<u>2.083</u> m	(x) <u>1.96</u>	(=) <u>4.166</u> L				
Depth to product: <u>—</u> m		Product Thickness: <u>—</u> m		Verified with Bailer: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N					

Water Quality Parameters								
Beginning purge time: <u>10:50</u>		Ending purge time: <u>11:06</u>			Pump Intake Depth (mbtoc): <u>3.541</u>			
Litres	Time	PH	Temp °C	Cond $\mu$ S/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
<u>0.2</u>	<u>10:51</u>	<u>7.02</u>	<u>18.6</u>	<u>223.4</u>	<u>5.06</u>	<u>2.1</u>	<u>2.039</u>	<u>Brown, turbid, no odour.</u>
<u>1.0</u>	<u>10:54</u>	<u>6.25</u>	<u>18.2</u>	<u>193.0</u>	<u>4.70</u>	<u>38.1</u>	<u>2.125</u>	<u>Brown, slightly cloudy, no odour</u>
<u>1.8</u>	<u>10:57</u>	<u>6.19</u>	<u>18.9</u>	<u>191.1</u>	<u>4.28</u>	<u>59.8</u>	<u>2.149</u>	<u>" " "</u>
<u>2.6</u>	<u>11:00</u>	<u>6.18</u>	<u>19.2</u>	<u>191.5</u>	<u>4.33</u>	<u>74.0</u>	<u>2.197</u>	<u>" " "</u>
<u>3.4</u>	<u>11:03</u>	<u>6.16</u>	<u>19.7</u>	<u>190.8</u>	<u>4.21</u>	<u>83.4</u>	<u>2.236</u>	<u>" " "</u>
<u>4.2</u>	<u>11:06</u>	<u>6.15</u>	<u>19.9</u>	<u>192.6</u>	<u>4.16</u>	<u>87.1</u>	<u>2.260</u>	<u>" " "</u>
*pH, temp, cond readings not necessary if well is purged dry				Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth				
<u>4.166</u>	Total Well Volume Actual amount of water prior to sampling			Sample time <u>11:07</u>		Containers used <u>6</u>		
<u>200</u>	Flow rate mL/minute			Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA		Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N		

Field QC Checks			
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	<u>Metals, TRH, BTEX, PAH, Phenols, Cations / Anions</u>
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA	
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N <input type="checkbox"/> NA	
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA	
Duplicate sample collected?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N	
Rinsate blank collected?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N	Duplicate sample ID <u>—</u>
			Rinsate blank ID <u>—</u>





# Groundwater - Well Sampling Data Form

Job Information	
Date: <u>31/10/13</u>	Time: arrive <u>12:00</u> depart <u>12:40</u>
Project Name: <u>Symphony</u>	Project Number: <u>0207423</u>
Site Location: <u>Mt. Piper</u>	Sampler: <u>D. Brookes</u>
Well ID: <u>MJ-X-MWMP05</u>	Weather: <u>Fine</u>

Equipment	
Water quality equipment description:	Interface probe number:
Purging equipment: (please circle)	Bailer type: <b>Plastic</b> <b>Teflon</b>
	Pump type: <b>Peristaltic</b> <b>Submersible</b> <b>Micro-purge</b> <b>Amazon</b> <b>Other:</b>

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	<u>50mm</u>	100mm	125mm	150mm	200mm	250mm	300mm	<b>Volume of water in well / V</b> $= Pr \times r \times h$ V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	<u>1.96</u>	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
<u>4.038</u> m	(-) <u>2.173</u> m	(=) <u>1.865</u> m							
	Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume						
	<u>1.865</u> m	(x) <u>1.96</u>	(=) <u>3.65</u> L						
Depth to product: _____ m	Product Thickness: _____ m	Verified with Bailer:	<input type="checkbox"/> Y	<input type="checkbox"/> N					

Water Quality Parameters								
Beginning purge time:			Ending purge time:				Pump Intake Depth (mbtoc):	
Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
<u>0.2</u>	<u>12:15</u>	<u>6.21</u>	<u>17.1</u>	<u>689</u>	<u>2.42</u>	<u>-18.6</u>	<u>2.335</u>	<u>clearly, no odour, light orange</u>
<u>0.8</u>	<u>12:18</u>	<u>6.11</u>	<u>17.6</u>	<u>673</u>	<u>0.06</u>	<u>-20.2</u>	<u>2.278</u>	
<u>1.4</u>	<u>12:24</u>	<u>6.09</u>	<u>18.2</u>	<u>682</u>	<u>0.10</u>	<u>-20.2</u>	<u>2.262</u>	
<u>2.0</u>	<u>12:24</u>	<u>6.07</u>	<u>17.6</u>	<u>668</u>	<u>0.17</u>	<u>-17.2</u>	<u>2.265</u>	
<u>2.6</u>	<u>12:27</u>	<u>6.06</u>	<u>17.2</u>	<u>657</u>	<u>0.21</u>	<u>-12.3</u>	<u>2.282</u>	
<u>3.2</u>	<u>12:30</u>	<u>6.06</u>	<u>17.1</u>	<u>652</u>	<u>0.26</u>	<u>-6.4</u>	<u>2.282</u>	
<u>3.8</u>	<u>12:33</u>	<u>6.06</u>	<u>17.1</u>	<u>651</u>	<u>0.24</u>	<u>-4.4</u>	<u>2.282</u>	

\*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

<u>3.8</u>	<b>Total Well Volume</b> Actual amount of water prior to sampling	Sample time <u>12:33</u>	Containers used <u>6</u>
<u>200</u>	<b>Flow rate</b> mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Rinsate blank collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N

Metals, TRH, BTEX, PAH, Phenols, Cations / Anions

Duplicate sample ID \_\_\_\_\_

Rinsate blank ID \_\_\_\_\_





# Groundwater - Well Sampling Data Form

Job Information	
Date: 31/10/13	Time: arrive 10:25 depart 11:15
Project Name: Symphony	Project Number: 0207423
Site Location: Mt. Piper	Sampler: D. Brookes
Well ID: MJ-X-MWMP06	Weather: Fine

Equipment	
Water quality equipment description: YSI	Interface probe number: SYD 3894
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible <b>Micro-purge</b> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
4.020 m	(-) 2.150 m	(=) 1.870 m							
			Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume				
			1.87 m	(x) 1.96	(=) 3.6 L				
Depth to product: — m		Product Thickness: — m		Verified with Bailer: <input checked="" type="checkbox"/> Y <input type="checkbox"/> NP					

Water Quality Parameters									
Beginning purge time:			Ending purge time:				Pump Intake Depth (mbtoc):		
Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments	
0.2	10:49	6.31	16.5	660	0.11	4.2	2.248	Turbid, no odour, red/brown	
0.8	10:52	6.17	17.0	666	0.22	4.5	2.225		
1.4	10:55	6.13	17.1	672	0.29	7.2	2.222		
2.0	10:58	6.09	16.8	668	0.32	13.4	2.226		
2.6	11:01	6.07	17.2	671	0.41	21.7	2.220		
3.2	11:04	6.05	17.6	692	0.46	29.1	2.256	clear, colourless, no odour.	
3.8	11:07	6.05	17.6	663	0.45	28.9	2.332		
*pH, temp, cond readings not necessary if well is purged dry							Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth		
3.8	Total Well Volume			Actual amount of water prior to sampling			Sample time	Containers used	
							11:08	6	
200	Flow rate mL/minute			Did field parameters stabilise?			Was the well dry purged?		
				<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA			<input type="checkbox"/> Y <input checked="" type="checkbox"/> N		

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N
Rinsate blank collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Duplicate sample ID: _____ Rinsate blank ID: _____	

Metals, TRH, BTEX, PAH, Phenols, Cations / Anions



# Groundwater - Well Sampling Data Form

Job Information	
Date: 18.12.13	Time: arrive 16.00 depart
Project Name: Symphony	Project Number: 0507423
Site Location: Mt Piper	Sampler: T. Shaw
Well ID: MK-MW01	Weather: overcast.

Equipment	
Water quality equipment description: YSI (104100323)	Interface probe number: Aetech
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible Micro-purge Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
6.968 m	(-) 3.205 m	(=) 3.763 m							
Water Column		(x) Conversion Factor	(=) Litres per 1 Well Volume						
~ 3.8 m		(x) ~ 2	(=) ~ 7.6 L						
Depth to product:	_____ m	Product Thickness:	_____ m	Verified with Bailer:		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N			

Water Quality Parameters									
Beginning purge time:			Ending purge time:				Pump Intake Depth (mbtoc):		Comments
Litres	Time	PH	Temp °C	Cond µS/cm	DO mg/L	Redox mV	Drawdown <10cm		
0.2	16.02	6.33	17.5	338.0	1.30	28.0	3.283	clear, colourless, no odour	
0.6	16.05	6.26	17.5	325.6	0.57	51.9	3.354		
1	16.08	6.28	17.5	322.5	0.78	57.9	3.405		
1.4	16.11	6.30	17.8	323.4	0.73	64.5	3.472		
1.8	16.14	6.35	17.7	321.7	0.71	70.4	3.535		
2.1	16.17	6.30	17.6	319.4	0.71	74.6	3.585		
2.5	16.20	6.30	17.5	317.7	0.72	78.2	3.642		

\*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

2.5 L	Total Well Volume	Sample time 16.22	Containers used 6
~130	Actual amount of water prior to sampling		
	Flow rate 400ml/3min	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N
	mL/minute		

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Rinsate blank collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
	Duplicate sample ID _____
	Rinsate blank ID _____



# Groundwater - Well Sampling Data Form

Job Information	
Date: 18.12.13	Time: arrive 10:10 depart 11:05
Project Name: Symphony	Project Number: 0207423
Site Location: MA Piper	Sampler: T. Shaw
Well ID: MK-mm02	Weather: fine

Equipment	
Water quality equipment description: VSI (10H100323)	Interface probe number: Geotech
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible Micro-purge Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V $= Pr \times r \times h$ V = volume in litres $P = 3.14159$ r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth (-) Water level (=) Water Column	$6.074$ m (-) $2.345$ m (=) $3.729$ m Water Column (x) Conversion Factor (=) Litres per 1 Well Volume $\sim 3.7$ m (x) $\sim 2$ (=) $\sim 7.4$ L								
Depth to product: _____ m	Product Thickness: _____ m	Verified with Bailer: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N							

Water Quality Parameters									
Beginning purge time:			Ending purge time:				Pump Intake Depth (mbtoc):		
Litres	Time	PH	Temp °C	Cond $\mu S/cm$	DO mg/L	Redox mV	Drawdown <10cm	Comments	
0.2	1020	5.12	19.1	768	1.11	138.6	2.407	slightly cloudy, no odour	
0.725	1023	5.05	18.2	751	0.61	143.8	2.430	175 slow flow rate	
1.025	1026	5.05	18.4	760	0.85	135.9	2.440		
1.5	1029	5.11	18.4	772	0.98	131.2	2.452		
2	1032	5.14	18.1	782	1.10	128.5	2.462		
2.5	1035	5.25	17.9	791	1.09	123.9	2.472		
3	1038	5.84	17.9	797	1.09	118.9	2.484		
3.5	1041	5.92	17.9	805	1.08	115.1	2.494		
4	1044	5.94	18.0	808	1.10	111.3	2.500		
4.5	1047	6.04	17.8	814	1.14	105.0	2.508		
*pH, temp, cond readings not necessary if well is purged dry						Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth			
4.5L	Total Well Volume		Actual amount of water prior to sampling			Sample time 10:48		Containers used 6	
~165.	Flow rate		mL/minute 500mL/3min.			Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA		Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N	

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Rinsate blank collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Duplicate sample ID _____	
Rinsate blank ID _____	





# Groundwater - Well Sampling Data Form

Job Information	
Date: 18.12.13	Time: arrive 09.15 depart 10.10
Project Name: Symphony	Project Number: 0207473
Site Location: Mt Piper	Sampler: T. Shaw
Well ID: MK-MW03	Weather: fine.

Equipment	
Water quality equipment description: YSI (101100323)	Interface probe number: Geotech
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible Micro-purge Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
6.855 m	(-) 3.185 m	(=) 3.670 m							
Water Column		(x) Conversion Factor	(=) Litres per 1 Well Volume						
~3.7 m		(x) ~2	(=) ~7.4 L						
Depth to product: _____ m	Product Thickness: _____ m	Verified with Bailer:	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N						

Water Quality Parameters								
Beginning purge time: 09.24			Ending purge time:				Pump Intake Depth (mbtoc):	
Litres	Time	PH	Temp °C	Cond $\mu$ S/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.2	09.26	5.69	18.5	933	6.48	132.3	3.215	slightly cloudy
0.6	09.29	5.53	17.9	910	1.38	118.0	3.226	clear + colourless
0.99	09.32	5.53	17.8	910	0.59	100.0	3.234	
1.38	09.35	5.54	17.7	909	0.51	88.7	3.244	
1.77	09.38	5.54	17.7	906	0.71	83.5	3.253	
2.16	09.41	5.54	17.7	907	0.84	81.9	3.256	
3.07	09.48	5.55	17.8	907	1.00	81.6	3.272	

\*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

3.14	Total Well Volume Actual amount of water prior to sampling	Sample time 09.50	Containers used 6
130	Flow rate mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N

Field QC Checks		
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N
Rinsate blank collected?	<input checked="" type="checkbox"/> Y	<input checked="" type="checkbox"/> N
Duplicate sample ID _____		
Rinsate blank ID R01-171213-T5		



# Groundwater - Well Sampling Data Form

Job Information	
Date: 19.12.13	Time: arrive 10.10 depart
Project Name: Symphony	Project Number: 0207423
Site Location: Mt Piper	Sampler: T. Shaw
Well ID: MK-MW04	Weather: fine

Equipment	
Water quality equipment description: YSI (104100323)	Interface probe number: Geotech
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible Micro-purge Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
6.980 m	(-) 3.133 m	(=) 3.847 m							
Water Column			(x) Conversion Factor	(=) Litres per 1 Well Volume					
3.85 m			(x) ~2	(=) ~7.7 L					
Depth to product:	m		Product Thickness:	m		Verified with Bailer: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N			

Water Quality Parameters									
Beginning purge time:			Ending purge time:				Pump Intake Depth (mbtoc):		Comments
Litres	Time	PH	Temp °C	Cond µS/cm	DO mg/L	Redox mV	Drawdown <10cm		
0.2	10:24	6.45	20.0	551.5	0.21	-5.7	3.206	clear, colourless, organic odour oily looking very very light white film on the surface of water -	
0.6	10:27	6.50	18.9	521	0.25	-21.6	3.250		
0.9	10:30	6.65	19.0	521	0.24	-28.3	3.300		
1.2	10:33	6.63	19.0	520	0.35	-30.0	3.350		
1.5	10:36	6.71	19.0	521	0.43	-32.5	3.401		
1.8	10:39	6.76	18.8	518	0.44	-34.3	3.480		
2.1	10:42	6.76	18.9	516	0.32	-34.0	3.544		
2.3	10:44	6.76	19.0	516	0.31	-34.5	3.589		

\*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

2.3L	Total Well Volume	Actual amount of water prior to sampling	Sample time	10.45	Containers used	6
100	Flow rate	lowest flow rate possible	Did field parameters stabilise?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Rinsate blank collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Duplicate sample ID	_____
Rinsate blank ID	_____



# Groundwater - Well Sampling Data Form

Job Information	
Date: 19.12.13	Time: arrive _____ depart _____
Project Name: Symphony	Project Number: 0207423
Site Location: Mt Piper	Sampler: T. Shaw
Well ID: MK-MW05	Weather: fine.

Equipment	
Water quality equipment description: YSI (10H100323)	Interface probe number: _____
Purging equipment: (please circle)	Bailer type: Plastic Teflon Pump type: Peristaltic Submersible Micro-purge Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = $\pi r^2 h$ V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	(1.96)	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth (-) Water level (=) Water Column	5.754 m (-) 4.232 m (=) 1.522 m								
Water Column (x) Conversion Factor (=) Litres per 1 Well Volume		~ 1.6 m (x) ~ 2 (=) ~ 3.2 L							
Depth to product: _____ m	Product Thickness: _____ m	Verified with Bailer: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N							

Water Quality Parameters									
Beginning purge time:			Ending purge time:				Pump Intake Depth (mbtoc):		
Litres	Time	PH	Temp °C	Cond $\mu$ S/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments	
0.2	9.17	6.78	20.0	611.25	0.33	-11.5	-	cloudy, grey, no odour	
0.65	9.20	6.33	19.3	594	0.29	15.8	-		
0.98	9.23	6.29	20.0	596	0.24	32.1	4.414		
1.3	9.26	6.26	20.7	611	0.19	33.1	4.424		
1.6	9.29	6.29	20.3	606	0.18	22.3	4.440		
1.9	9.32	6.32	20.4	606	0.17	19.9	4.460		
2.2	9.35	6.28	20.0	600	0.17	22.7	4.470		
2.5	9.38	6.29	19.9	597	0.17	19.9	4.490		
2.7	9.40	6.29	20.0	597	0.17	18.3	4.500		
*pH, temp, cond readings not necessary if well is purged dry						Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth			
2.7 L	Total Well Volume		Actual amount of water prior to sampling		Sample time 9.41		Containers used 6		
100 + 10	Flow rate		mL/minute		Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA		Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N		

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Rinsate blank collected?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Duplicate sample ID _____	
Rinsate blank ID R01-181213-TS	



# Groundwater - Well Sampling Data Form

Job Information	
Date: 18.12.13 / 19.12.13	Time: arrive 12.45 / 19.12.13 depart 11.45 / 19.12.13
Project Name: Symphony	Project Number: 0207423
Site Location: Mt Piper	Sampler: T. Shaw
Well ID: MK-MW06	Weather: overcast

Equipment	
Water quality equipment description: YSI (10H100323)	Interface probe number:
Purging equipment: (please circle)	Bailer type: Plastic Teflon
Pump type: Peristaltic	Submersible Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Total Well Depth	(-) Water level	(=) Water Column							
<del>5.764</del> m	<del>4.932</del> m	0.387 m							
5.082	4.695	~ 0.4	(x) Conversion Factor (=) Litres per 1 Well Volume						
			~ 2	(=) 0.8					
Depth to product:	m	Product Thickness:	m	Verified with Bailer:	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N				

Water Quality Parameters									
Beginning purge time:			Ending purge time:				Pump Intake Depth (mbtoc):		
Litres	Time	PH	Temp °C	Cond µS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments	
0.5	11:25	5.90	17.1	964µS	1.25	42.8		Purged with a bailer 18.12.13	
1	11:26	6.03	16.5	880	1.55	31.4		turbid, brown, no odour	
1.5	11:29	6.04	16.7	799	1.47	27.1		Purged dry at 1.5L	
POST Sampling									
19.12.13	12:10	6.53	19.3	837µS	0.24	23.6		cloudy brown, no odour	
*pH, temp, cond readings not necessary if well is purged dry							Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth		

1.5L	Total Well Volume	Sample time	Containers used
	Actual amount of water prior to sampling	13:00	6
	Flow rate mL/minute	Did field parameters stabilise?	Was the well dry purged?
		Y N NA	Y N

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Rinsate blank collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Duplicate sample ID	_____
Rinsate blank ID	_____



# Groundwater - Well Sampling Data Form

Job Information	
Date: 17.12.13	Time: arrive 14.40 depart
Project Name: Symphony	Project Number: 0207423
Site Location: Mt Piper	Sampler: T. Shaw
Well ID: MK-MW07	Weather: fine

Equipment	
Water quality equipment description: ISI (104100323)	Interface probe number: Gated
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible Micro-purge Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
7.802 m	(-) 3.359 m	(=) 4.443 m							
			Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume				
			~ 4.4 m	(x) ~ 2	(=) ~ 8.8 L				
Depth to product:	— m	Product Thickness:	— m	Verified with Bailer:	<input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N				

Water Quality Parameters									
Beginning purge time: 14.51			Ending purge time:				Pump Intake Depth (mbtoc):		
Litres	Time	PH	Temp °C	Cond µS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments	
0.2	14.53	5.74	19.5	309.2	3.49	122.5	3.551	clear, colourless, no odour (slow pump)	
0.65	14.56	5.59	19.7	302.6	0.65	140.4	3.630		
1.015	14.59	5.61	19.9	305.4	0.55	144.5	3.755	slow pump again	
1.325	15.02	5.63	20.4	308.5	0.53	146.9	3.880		
1.705	15.05	5.61	19.5	302.5	0.58	149.1	3.943		
2.1	15.09	5.61	19.5	302.1	0.60	150.3	3.982		
2.3	15.12	5.61	18.9	298.1	0.65	152.1	4.053		
*pH, temp, cond readings not necessary if well is purged dry						Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth			
2.3 L	Total Well Volume		Actual amount of water prior to sampling		Sample time 15.15		Containers used 6		
125/100	Flow rate		mL/minute		Did field parameters stabilise?		Was the well dry purged?		
				<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA		<input type="checkbox"/> Y <input checked="" type="checkbox"/> N			

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Rinsate blank collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Duplicate sample ID _____	
Rinsate blank ID _____	



# Groundwater - Well Sampling Data Form

Job Information	
Date: 17.12.13 / 18.12.13 / 19.12.13	Time: arrive 16:05 depart 16:20
Project Name: Symphony	Project Number: 0207423
Site Location: Mt Piper	Sampler: T. Shaw
Well ID: MK_MW08	Weather: fine

Equipment	
Water quality equipment description: YSI (104100323)	Interface probe number:
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible Micro-purge Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
6.304 m	(-) 6.236 m	(=) 0.068 m							
Water Column		(x) Conversion Factor	(=) Litres per 1 Well Volume						
0.07 m		(x) 2	(=) 0.14 L						
Depth to product:	Product Thickness:		Verified with Bailer:		<input type="checkbox"/> Y <input checked="" type="checkbox"/> N				

Water Quality Parameters									
Beginning purge time: 16:12			Ending purge time:				Pump Intake Depth (mbtoc):		
Litres	Time	PH	Temp °C	Cond µS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments	
0.1	16:17	5.98	21.4	853	2.69	30.4		cloudy brown / turbid, no odour	
								Purged dry.	
								insufficient water for additional water quality parameters.	
0.1 L				*pH, temp, cond readings not necessary if well is purged dry			Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth		
Total Well Volume		Actual amount of water prior to sampling		Sample time		Containers used			
				18.12.13 / 11:53		3			
Flow rate mL/minute				Did field parameters stabilise?		Was the well dry purged?			
				Y N NA		Y N			

Field QC Checks				
Was pre-cleaned sampling equipment used for these samples?	Y	N		
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N		
Was documentation of equipment conducted?	Y	N	NA	
Were air bubbles present in vials at time of collection?	Y	N	NA	
Was sample for metals field filtered prior to preservations?	Y	N	NA	
Duplicate sample collected?	Y	N		
Rinsate blank collected?	Y	N		
* 1 vial sampled 18.12.13 insufficient water for 2 full vials 11:53am * 1 ultra trace metal + ferrous iron sampled 19.12.13/12:30 ✓				





# Groundwater - Well Sampling Data Form

Job Information	
Date: 18.12.13	Time: arrive 14.45 depart 1540
Project Name: Symphony	Project Number: 0007423
Site Location: Mt Piper	Sampler: T. Shaw
Well ID: MK-MW09	Weather: overcast.

Equipment	
Water quality equipment description: YSL (10H100323)	Interface probe number: Geotech.
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible Micro-purge Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
5.885 m	(-) 1.730 m	(=) 4.155 m							
			Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume				
			~4.2 m	(x) ~2	(=) ~8.4 L				
Depth to product: _____ m		Product Thickness: _____ m		Verified with Bailer: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N					

Water Quality Parameters								
Beginning purge time:			Ending purge time:				Pump Intake Depth (mbtoc): ~5.4	
Litres	Time	PH	Temp °C	Cond µS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.2	15.02	5.79	19.7	1362	1.14	-13.9	1.852	clear, colourless, no odour
0.6	15.05	5.84	19.4	1349	0.56	-11.1	1.964	
1	15.08	5.86	19.3	1339	0.68	-12.0	2.095	
1.4	15.11	5.84	19.1	1322	0.75	-7.8	2.228	
1.8	15.14	5.82	19.2	1317	0.80	-2.0	2.351	
2.2	15.17	5.82	19.0	1303	0.84	0.2	2.456	
2.6	15.20	5.81	18.9	1289	0.85	1.9	2.570	
3	15.23	5.81	18.9	1279	0.87	2.7	2.685	

\*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

3L	Total Well Volume	Actual amount of water prior to sampling	Sample time 15.25	Containers used 6
125	Flow rate mL/minute	→ slowest flow rate possible.	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Rinsate blank collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Duplicate sample ID	_____
Rinsate blank ID	_____



# Groundwater - Well Sampling Data Form

Job Information	
Date: <u>11.2.13</u>	Time: arrive <u>0800</u> depart <u>0910</u>
Project Name: <u>Phase 4 BSA - Mt Piper</u>	Project Number: <u>0207423</u>
Site Location: <u>Mt Piper</u>	Sampler: <u>C. Ford</u>
Well ID: <u>MK-mw10</u>	Weather: <u>Fine</u>

Equipment	
Water quality equipment description: <u>YSI Pro Plus</u>	Interface probe number: <u>Airmet 23973</u>
Purging equipment: (please circle)	Bailer type: <u>Plastic</u> <u>Teflon</u>
	Pump type: <u>Peristaltic</u> <u>Submersible</u> <u>Micro-purge</u> <u>Amazon</u> <u>Other:</u>

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	<u>50mm</u>	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	<u>1.96</u>	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
<u>23.573</u> m	(-) <u>3.124</u> m	(=) <u>23.449</u> m							
Water Column		(x) Conversion Factor	(=) Litres per 1 Well Volume						
<u>23.449</u> m		(x) <u>1.96</u>	(=) <u>45.96</u> L						
Depth to product: <u>-</u> m	Product Thickness: <u>-</u> m	Verified with Bailer: <input type="checkbox"/> Y <input checked="" type="checkbox"/> N							

Water Quality Parameters									
Beginning purge time: <u>0818</u>			Ending purge time: <u>0855</u>				Pump Intake Depth (mbtoc): <u>16.00</u>		
Litres	Time	PH	Temp °C	Cond µS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments	
0.1	0820	<u>6.41</u>	<u>18.8</u>	<u>390.7</u>	<u>0.28</u>	<u>36.7</u>	<u>3.021</u>	<u>Cloudy, no odour or stain</u>	
0.5	0823	<u>6.84</u>	<u>18.3</u>	<u>412.9</u>	<u>0.28</u>	<u>-86.0</u>	<u>3.024</u>	<u>Same as above</u>	
1.0	0828	<u>7.27</u>	<u>18.8</u>	<u>435.8</u>	<u>0.27</u>	<u>-90.4</u>	<u>3.091</u>	<u>Same as above</u>	
1.5	0832	<u>7.33</u>	<u>18.8</u>	<u>433.9</u>	<u>0.27</u>	<u>-76.5</u>	<u>3.111</u>	<u>Same as above</u>	
2.0	0836	<u>7.39</u>	<u>18.2</u>	<u>434.0</u>	<u>0.26</u>	<u>-43.3</u>	<u>3.121</u>	<u>Same as above</u>	
2.5	0839	<u>7.43</u>	<u>19.2</u>	<u>435.1</u>	<u>0.25</u>	<u>-26.6</u>	<u>3.224</u>	<u>Same as above</u>	
3.0	0844	<u>7.48</u>	<u>19.5</u>	<u>436.2</u>	<u>0.24</u>	<u>-02.7</u>	<u>3.111</u>	<u>Same as above</u>	
3.5	0847	<u>7.52</u>	<u>19.3</u>	<u>435.5</u>	<u>0.24</u>	<u>10.9</u>	<u>3.521</u>	<u>Turbid, no odour or stain</u>	
4.0	0851	<u>7.53</u>	<u>19.4</u>	<u>436.4</u>	<u>0.23</u>	<u>21.9</u>	<u>3.532</u>	<u>Same as above</u>	
4.5	0855	<u>7.52</u>	<u>19.1</u>	<u>434.1</u>	<u>0.23</u>	<u>22.4</u>	<u>3.531</u>	<u>Same as above</u>	
*pH, temp, cond readings not necessary if well is purged dry						Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth			
<u>4.5</u>	Total Well Volume Actual amount of water prior to sampling			Sample time <u>0855</u>		Containers used <u>6</u>			
<u>125</u>	Flow rate mL/minute			Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA			Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N		

Field QC Checks		
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N
Rinsate blank collected?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N
Duplicate sample ID		<u>-</u>
Rinsate blank ID		<u>-</u>

Fill : 60s  
 Discharge : 20s



# Groundwater - Well Sampling Data Form

Job Information	
Date: 18.12.13	Time: arrive 13:45 depart 14:35
Project Name: Symphony	Project Number: 0207423
Site Location: Mt Piper	Sampler: T. Shaw
Well ID: MK-MW11	Weather: overcast

Equipment	
Water quality equipment description: YSI (104100323)	Interface probe number: apotech.
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible Micro-purge Amazon Other:

Well Gauging and Purge Volume Calculations											
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm		
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7			
Total Well Depth	(-) Water level	(=) Water Column									
5.115 m	(-) 3.277 m	(=) 1.838 m									
Water Column		(x) Conversion Factor	(=) Litres per 1 Well Volume								
~ 1.8 m		(x) ~ 2	(=) ~ 3.6								
Depth to product: — m	Product Thickness: — m	Verified with Bailer:	<table border="1"> <tr> <td>Y</td> <td>N</td> </tr> </table>							Y	N
Y	N										

Water Quality Parameters									
Beginning purge time:			Ending purge time:				Pump Intake Depth (mbtoc):		Comments
Litres	Time	PH	Temp °C	Cond $\mu$ S/cm	DO mg/L	Redox mV	Drawdown <10cm		
0.2	14:00	5.67	18.3	691 $\mu$ S/cm	1.48	66.2	3.318	cloudy brown / grey, no odour	
0.65	14:03	5.61	17.9	678	0.55	67.5	3.349		
1.075	14:07	5.62	18.3	678	0.48	65.2	3.374		
1.8	14:11	5.63	17.8	668	0.61	68.4	3.402		
1.9	14:15	5.62	17.6	657	0.66	71.3	3.425		
2.2	14:18	5.62	17.9	658	0.64	68.1	3.444		
2.4	14:20	5.62	18.0	667	0.66	66.8	3.455		

\*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

2.4	Total Well Volume Actual amount of water prior to sampling	Sample time 14:21	Containers used 6
125 / 100	Flow rate mL/minute	Did field parameters stabilise? (Y) (N) (NA)	Was the well dry purged? (Y) (N)

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	(Y) (N)
Was pre-cleaning sampling equipment properly protected from contamination?	(Y) (N)
Was documentation of equipment conducted?	(Y) (N) (NA)
Were air bubbles present in vials at time of collection?	(Y) (N) (NA)
Was sample for metals field filtered prior to preservations?	(Y) (N) (NA)
Duplicate sample collected?	(Y) (N)
Rinsate blank collected?	(Y) (N)

Duplicate sample ID \_\_\_\_\_

Rinsate blank ID \_\_\_\_\_





# Groundwater - Well Sampling Data Form

Job Information	
Date: 19/12/13	Time: arrive 11:50 depart 12:30
Project Name: Symphony	Project Number: 0207420
Site Location: M11 Paper	Sampler: D. Brookes
Well ID: ML-MW05	Weather: Fine

Equipment	
Water quality equipment description: Y31	Interface probe number: M1M-199
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible <b>Micro-purge</b> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = $\pi r^2 \times h$ V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
19.000 m	(-) 16.890 m	(=) 2.1 m							
			Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume				
			2.1 m	(x) 1.96	(=) 4.2 L				
Depth to product:	→	m	Product Thickness:	→	m	Verified with Bailer:	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	

Water Quality Parameters								
Beginning purge time:			Ending purge time:				Pump Intake Depth (mbtoc):	
Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.2	11:57	6.73	22.8	2593	1.69	-57.0	17.050	Cloudy, grey, no odour.
0.8	12:00	6.71	22.4	2591	1.31	-53.9	17.055	" "
1.4	12:03	6.73	22.2	2592	1.36	-47.8	17.055	" "
2.0	12:06	6.77	21.6	2559	1.60	-42.6	17.055	" "
2.6	12:09	6.82	21.1	2524	2.03	-40.4	17.100	" "
3.2	12:12	6.85	20.9	2499	2.35	-36.9	17.105	" "
3.8	12:15	6.85	20.9	2496	2.53	-35.9	17.105	" "

\*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

3.8	<b>Total Well Volume</b> Actual amount of water prior to sampling	Sample time: 12:15	Containers used: 6+6
200	<b>Flow rate</b> mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N

Field QC Checks		
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Rinsate blank collected?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N

Duplicate sample ID: Dup01\_191213 DB  
Rinsate blank ID: R01-191213 DB



# Groundwater - Well Sampling Data Form

Job Information	
Date: 18.12.13	Time: arrive 12.50 depart 1.30
Project Name: Symphony	Project Number: 0207423
Site Location: Mt Piper	Sampler: T. Shaw
Well ID: ML-mw07	Weather: fine

Equipment	
Water quality equipment description: VSI (104100323)	Interface probe number: Geotech
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible Micro-purge Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
5.964 m	(-) 4.992 m	(=) 0.972 m							
Water Column		(x) Conversion Factor	(=) Litres per 1 Well Volume						
0.97 m		(x) 2	(=) 1.94 L						
Depth to product: — m	Product Thickness: — m	Verified with Bailer:	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N						

Water Quality Parameters								
Beginning purge time: 12.56			Ending purge time:				Pump Intake Depth (mbtoc):	
Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.2	12.58	6.50	18.8	501	0.96	-8.7	5.075	cloudy, pale brown, no odour / slow flow rate
0.65	13.01	6.27	17.2	467.5	0.92	-5.7	5.120	
1	13.04	6.29	17.5	465.7	0.88	-4.3	5.173	
1.4	13.07	6.27	17.6	458.4	0.78	4.4	5.235	
1.7	13.10	6.29	17.2	443.1	0.70	11.2	5.283	
1.9	13.12	6.29	17.1	436.5	0.64	14.2	5.318	
2.1	13.14	6.28	16.7	436.2	0.71	16.1	5.362	
2.3	13.16	6.25	16.8	437.3	0.54	17.1		

*pH, temp, cond readings not necessary if well is purged dry			Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth					
2.3L	Total Well Volume	Actual amount of water prior to sampling	Sample time	13.17	Containers used	6		
100	Flow rate mL/minute		Did field parameters stabilise?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N		

Field QC Checks		
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N
Rinsate blank collected?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N
Duplicate sample ID	_____	
Rinsate blank ID	_____	





# Groundwater - Well Sampling Data Form

Job Information	
Date: 18.12.13	Time: arrive 1430 depart 1540
Project Name: Phase 4 ESA - Mt Piper	Project Number: 0207423
Site Location: Mt Piper Power Station	Sampler: C. Ford
Well ID: ML_mw05	Weather: FINE

Equipment	
Water quality equipment description: YSI PRO PLUS	Interface probe number: AIRMET 23973
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible <u>Micro-purge</u> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
7.702 m	(-) 5.41 m	(=) 2.292 m	mbgl						
	Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume						
	2.292 m	(x) 1.96	(=) 4.492 L						
Depth to product:	- m	Product Thickness:	- m	Verified with Bailer:	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N				

Water Quality Parameters								
Beginning purge time: 1445			Ending purge time:				Pump Intake Depth (mbtoc): 6.500	
Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
0.1	1450	5.60	22.1	279.2	0.32	171.9	5.421	turbid, no odour or steel
0.5	1454	5.27	17.5	249.1	1.53	185.0	5.441	Same as above
1.0	1458	5.23	17.1	229.3	2.67	187.8	5.462	Same as above
1.5	1501	5.27	17.2	291.9	4.13	185.2	5.471	Same as above
2.0	1507	5.33	19.0	291.5	3.58	200.1	5.491	Same as above
2.5	1513	4.92	16.6	321.2	2.24	187.6	5.52	Same as above
3.0	1516	4.93	16.7	379.1	2.47	178.1	5.54	Same as above
3.5	1520	4.94	16.5	381.2	2.43	186.2	5.62	Cloudy, no odour or steel
4.0	1525	4.94	16.5	384.3	2.20	187.4	5.62	Same as above
*pH, temp, cond readings not necessary if well is purged dry						Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth		
4.0	Total Well Volume		Actual amount of water prior to sampling		Sample time 1525		Containers used 7	
125	Flow rate		mL/minute		Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA		Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N	

Field QC Checks			
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	Discharges SS Fill : 20s
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA	
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N <input type="checkbox"/> NA	
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA	
Duplicate sample collected?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N	Duplicate sample ID _____
Rinsate blank collected?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N	Rinsate blank ID _____

*well gauged from ground level needs to be adjusted for with surveying data*





# Groundwater - Well Sampling Data Form

Job Information	
Date: 19/12/13	Time: arrive 08:30 depart 09:20
Project Name: 0207420 Symphony	Project Number: 0207420
Site Location: MH Piper	Sampler: D. Brookes
Well ID: ML-MW10	Weather: Fine

Equipment	
Water quality equipment description: Y <sub>51</sub>	Interface probe number: MIM-199
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible <u>Micro-purge</u> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
17.630 m	(-) 14.510 m	(=) 3.1 m							
Water Column		(x) Conversion Factor	Litres per 1 Well Volume						
3.1 m		(x) 1.96	= 6.2 L						
Depth to product:	Product Thickness:		Verified with Bailer: <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N						

Water Quality Parameters									
Beginning purge time:			Ending purge time:				Pump Intake Depth (mbtoc):		Comments
Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm		
0.2	08:38	6.62	17.1	1158	5.16	45.2	14.665	Slightly cloudy, grey, no odour	
0.8	08:41	6.48	16.5	1130	0.94	59.7	14.740	" "	
1.4	08:44	6.49	16.2	1121	2.28	66.8	14.823	" "	
2.0	08:47	6.50	16.7	1134	1.97	70.7	14.885	" "	
2.6	08:50	6.50	16.7	1136	1.61	77.8	14.900	" "	
3.2	08:53	6.50	16.8	1136	1.56	78.4	14.908	" "	

\*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

3.2	<b>Total Well Volume</b> Actual amount of water prior to sampling	Sample time 08:53	Containers used 5
200	<b>Flow rate</b> mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N

Field QC Checks	
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Rinsate blank collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Duplicate sample ID _____	
Rinsate blank ID _____	



# Groundwater - Well Sampling Data Form

Job Information	
Date: 16.12.13	Time: arrive 11.50 depart
Project Name: #F Symphony	Project Number: 0201423
Site Location: Mt Piper	Sampler: T. Shaw
Well ID: ML-MW12	Weather: overcast/hot

Equipment	
Water quality equipment description: YSI (104100323)	Interface probe number: Geotech
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible Micro-purge Amazon Other:

Well Gauging and Purge Volume Calculations									
casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (see in factor L/m)	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3	
Total Well Depth (-) Water level (=) Water Column									
9.050 m (-) 5.680 m (=) _____ m									
Water Column (x) Conversion Factor (=) Litres per 1 Well Volume									
_____ m (x) _____ (=) _____ L									
Depth to product: _____ m Product Thickness: _____ m Verified with Bailer: <input type="checkbox"/> Y <input type="checkbox"/> N									

Water Quality Parameters									
Beginning purge time: 12.01					Ending purge time:			Intake: 8m	
Litres	Time	PH	Temp °C	Cond $\mu$ S/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments	
0.2	12.02	6.59	27.6	0.516	5.57	422	5.792	Slightly cloudy, no odour	
0.65	12.05	6.32	24.1	0.2	6.70	60.8	5.946	(turn down flow rate)	
1.4	12.08	6.24	23.5	0.2	6.47	62.8	6.036		
1.3	12.11	6.24	23.7	0.2	5.97	60.3	6.127		
1.8	12.16	6.30	23.4	0.2	5.78	53.1	—		
2.1	12.19	6.20	23.3	0.2	5.72	52.3	6.347		
*pH, temp, cond readings not necessary if well is purged dry								Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth	

2.1 L	Total Well Volume Actual amount of water prior to sampling	Sample time 12.20	Containers used 6
1.50	Flow rate mL/minute	Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N

Field QC Checks	
Was pre-cleaning sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA
Duplicate sample collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N Duplicate sample ID _____
Rinsate blank collected?	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N Rinsate blank ID _____

(water above screen)





# Groundwater - Well Sampling Data Form

Job Information	
Date: 19/12/13	Time: arrive 9:50 depart 10:40
Project Name: Symphony	Project Number: 0207420
Site Location: Mt Piper	Sampler: D. Brookes
Well ID: ML-MW15	Weather: Fine

Equipment	
Water quality equipment description: Y31	Interface probe number: MIM-199
Purging equipment: (please circle)	Bailer type: Plastic Teflon
	Pump type: Peristaltic Submersible <u>Micro-purge</u> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V $= Pr \times r \times h$ V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
16.666 m	(-) 8.533 m	(=) 8 m							
Water Column		(x) Conversion Factor	(=) Litres per 1 Well Volume						
8 m		(x) 1.96	(=) 16 L						
Depth to product:	Product Thickness:		Verified with Bailer:						
- m	- m		Y N						

Water Quality Parameters									
Beginning purge time:			Ending purge time:				Pump Intake Depth (mbtoc):		Comments
Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm		
0.2	10:03	6.53	21.9	530	4.99	-35.2	8.570	Cloudy, light brown, no odour	
0.8	10:06	6.62	18.5	617	1.69	-88.9	8.745	" "	
1.4	10:09	6.60	18.2	607	1.48	-97.3	9.000	" "	
2.0	10:12	6.62	19.2	620	2.06	-96.0	9.103	cloudy, grey, no odour	
2.6	10:15	6.64	18.3	610	2.24	-97.8	9.191	" "	
3.2	10:18	6.64	18.4	600	3.01	-83.9	9.205	" "	
3.8	10:21	6.64	18.3	598	3.10	-82.3	9.285	" "	
4.4	10:24	6.64	18.5	595	3.19	-78.2	9.300	" "	

\*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

4.5	<b>Total Well Volume</b> Actual amount of water prior to sampling	Sample time 10:25	Containers used 6
200	<b>Flow rate</b> mL/minute	Did field parameters stabilise? <input checked="" type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA	Was the well dry purged? <input type="radio"/> Y <input checked="" type="radio"/> N

Field QC Checks		
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="radio"/> Y	<input type="radio"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="radio"/> Y	<input type="radio"/> N
Was documentation of equipment conducted?	<input checked="" type="radio"/> Y	<input type="radio"/> N <input type="radio"/> NA
Were air bubbles present in vials at time of collection?	<input type="radio"/> Y	<input checked="" type="radio"/> N <input type="radio"/> NA
Was sample for metals field filtered prior to preservations?	<input checked="" type="radio"/> Y	<input type="radio"/> N <input type="radio"/> NA
Duplicate sample collected?	<input type="radio"/> Y	<input checked="" type="radio"/> N
Rinsate blank collected?	<input type="radio"/> Y	<input checked="" type="radio"/> N
Duplicate sample ID		-
Rinsate blank ID		-





# Groundwater - Well Sampling Data Form

Job Information	
Date: <u>19.12.13</u>	Time: arrive <u>0917</u> depart <u>1035</u>
Project Name: <u>Phase II ESA - Mt Piper</u>	Project Number: <u>0207423</u>
Site Location: <u>Mt Piper Power Plant</u>	Sampler: <u>C. Ford</u>
Well ID: <u>ML-MW20</u>	Weather: <u>Fine</u>

Equipment	
Water quality equipment description: <u>YSI Pro Plus</u>	Interface probe number: <u>Airmet 29373</u>
Purging equipment: (please circle)	Bailer type: <u>Plastic</u> Teflon
	Pump type: <u>Peristaltic</u> Submersible <u>Micro-purge</u> Amazon Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	<u>50mm</u>	100mm	125mm	150mm	200mm	250mm	300mm	Volume of water in well / V = Pr x r x h V = volume in litres P = 3.14159 r = radius in cm h = height of water column in cm
Conversion Factor (volume in factor L/m)	0.49	<u>1.96</u>	7.85	12.3	17.7	31.4	49.1	70.7	
Total Well Depth	(-) Water level	(=) Water Column							
<u>24.768</u> m	(-) <u>22.250</u> m	(=) <u>2.518</u> m							
	Water Column	(x) Conversion Factor	(=) Litres per 1 Well Volume						
	<u>2.518</u> m	(x) <u>1.96</u>	(=) <u>4.94</u> L						
Depth to product: <u>-</u> m	Product Thickness: <u>-</u> m	Verified with Bailer: <input type="checkbox"/> Y <input checked="" type="checkbox"/> N							

Water Quality Parameters									
Beginning purge time: <u>0939</u>		Ending purge time: <u>1023</u>		Pump Intake Depth (mbtoc): <u>22.5</u>					
Litres	Time	PH	Temp °C	Cond $\mu$ S/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments	
0.1	0944	6.90	20.9	464.9	0.21	-24.7	22.410	Silty, no odour or sheen	
0.5	0948	6.51	18.3	482.3	0.22	-43.7	22.402	Same as above	
1.0	0952	6.38	18.1	447.4	0.24	-30.6	22.413	Same as above	
1.5	0957	6.26	17.7	425.6	0.27	-14.6	22.411	Cloudy, no odour or sheen	
2.0	<del>1000</del>	6.20	17.6	412.3	0.30	-3.1	22.402	Slightly cloudy, no odour or sheen	
2.5	1004	6.16	17.8	402.3	0.33	4.6	22.471	Same as above	
3.0	1008	6.13	17.7	396.1	0.38	11.0	22.470	Same as above	
3.5	1013	6.11	17.7	390.9	0.41	15.9	22.521	Clear, no odour or sheen	
4.0	1017	6.08	17.7	382.1	0.43	20.3	22.51	Same as above	
4.5	1023	6.07	17.7	381.1	0.40	22.4	22.62	Same as above	
*pH, temp, cond readings not necessary if well is purged dry				Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth					
<u>4.5</u>	Total Well Volume Actual amount of water prior to sampling			Sample time <u>1023</u>		Containers used <u>6</u>			
<u>125</u>	Flow rate mL/minute			Did field parameters stabilise? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA			Was the well dry purged? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N		

Field QC Checks			
Was pre-cleaned sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	Fill: 60s Discharge: 20s → 15s
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	
Was documentation of equipment conducted?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA	
Were air bubbles present in vials at time of collection?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N <input type="checkbox"/> NA	
Was sample for metals field filtered prior to preservations?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N <input type="checkbox"/> NA	
Duplicate sample collected?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N	
Rinsate blank collected?	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N	Duplicate sample ID <u>-</u>
			Rinsate blank ID <u>-</u>









**Environmental Resources Management Australia Pty Ltd**  
*PID Calibration Certificate*

Project Name :  Project Staff :   
Project No :  Date :

**Photo-ionisation Detector**

Make/Model No:   
Serial Number:  (Airmet Hire)

**Calibration Gas**

Calibration Gas:

**PID Calibration**

Zero Calibration

PID Reading:

Span Calibration

Desired PID Reading:   
Actual PID Reading:

**Certification**

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

Signature:	<input type="text" value="Traverse Shaw"/>	Date:	<input type="text" value="28.10.13"/>
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**ERM**  
**Environmental Resources Management Australia Pty Ltd**  
*PID Calibration Certificate*

Project Name :  Project Staff :   
Project No :  Date :

**Photo-ionisation Detector**

Make/Model No:   
Serial Number:

**Calibration Gas**

Calibration Gas:

**PID Calibration**

Zero Calibration

PID Reading:

Span Calibration

Desired PID Reading:   
Actual PID Reading:

**Certification**

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

Signature:	<input type="text" value="T. Shaw"/>	Date:	<input type="text" value="29.10.13"/>
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# Environmental Resources Management Australia Pty Ltd

## PID Calibration Certificate

Project Name :  Project Staff :

Project No :  Date :

### Photo-ionisation Detector

Make/Model No:   
Serial Number:

### Calibration Gas

Calibration Gas:

### PID Calibration

#### Zero Calibration

PID Reading:

#### Span Calibration

Desired PID Reading:   
Actual PID Reading:

### Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

Signature:	<input type="text" value="T. Shaw"/>	Date:	<input type="text" value="30.10.13"/>
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**Environmental Resources Management Australia Pty Ltd**  
*PID Calibration Certificate*

Project Name :  Project Staff :   
Project No :  Date :

**Photo-ionisation Detector**

Make/Model No:   
Serial Number:

**Calibration Gas**

Calibration Gas:

**PID Calibration**

Zero Calibration

PID Reading:

Span Calibration

Desired PID Reading:   
Actual PID Reading:

**Certification**

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

Signature:	<input type="text" value="Therese Shaw"/>	Date:	<input type="text" value="31.10.13"/>
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# Environmental Resources Management Australia Pty Ltd

## PID Calibration Certificate

Project Name :  Project Staff :   
Project No :  Date :

### Photo-ionisation Detector

Make/Model No:   
Serial Number:

### Calibration Gas

Calibration Gas:

### PID Calibration

#### Zero Calibration

PID Reading:

#### Span Calibration

Desired PID Reading:   
Actual PID Reading:

### Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

Signature:	<input type="text" value="T. Shaw"/>	Date:	<input type="text" value="01-11-13"/>
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# Environmental Resources Management Australia Pty Ltd

## PID Calibration Certificate

Project Name :  Project Staff :

Project No :  Date :

### Photo-ionisation Detector

Make/Model No:   
Serial Number:

### Calibration Gas

Calibration Gas:

### PID Calibration

#### Zero Calibration

PID Reading:

#### Span Callbration

Desired PID Reading:   
Actual PID Reading:

### Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

Signature:	<input type="text" value="T. Shaw"/>	Date:	<input type="text" value="06.11.13"/>
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**Environmental Resources Management Australia Pty Ltd**  
*PID Calibration Certificate*

Project Name :  Project Staff :   
 Project No :  Date :

**Photo-ionisation Detector**

Make/Model No:   
 Serial Number:

**Calibration Gas**

Calibration Gas:

**PID Calibration**

Zero Calibration

PID Reading:

Span Calibration

Desired PID Reading:   
 Actual PID Reading:

**Certification**

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

Signature:		Date:	19.11.13
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**Environmental Resources Management Australia Pty Ltd**  
*PID Calibration Certificate*

Project Name :  Project Staff :   
Project No :  Date :

**Photo-ionisation Detector**

Make/Model No:   
Serial Number:

**Calibration Gas**

Calibration Gas:

**PID Calibration**

Zero Calibration

PID Reading:

Span Calibration

Desired PID Reading:   
Actual PID Reading:

**Certification**

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

Signature:		Date:	20-11-13
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ERM

# Environmental Resources Management Australia Pty Ltd

## PID Calibration Certificate

Project Name :

Mt Piper

Project Staff :

T. Shaw

Project No :

0207423

Date :

21.11.13

### Photo-ionisation Detector

Make/Model No:

ProCheck Tiger

Serial Number:

### Calibration Gas

Calibration Gas:

Isobutylene.

### PID Calibration

#### Zero Calibration

PID Reading:

0.0 ppm

#### Span Calibration

Desired PID Reading:

1000 ppm

Actual PID Reading:

1000.0 ppm

### Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

Traverso Shaw

Signature:			Date:	21.11.13
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**Environmental Resources Management Australia Pty Ltd**  
*PID Calibration Certificate*

Project Name :  Project Staff :   
Project No :  Date :

**Photo-ionisation Detector**

Make/Model No:   
Serial Number:

**Calibration Gas**

Calibration Gas:

**PID Calibration**

Zero Calibration

PID Reading:

Span Calibration

Desired PID Reading:   
Actual PID Reading:

**Certification**

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

Signature:		Date:	26.11.13
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## PID Calibration Certificate

Instrument      PhoCheck Tiger  
Serial No.      T-105760



Air-Met Scientific Pty Ltd  
1300 137 067

Item	Test	Pass	Comments			
Battery	Charge Condition	✓				
	Fuses	✓				
	Capacity	✓				
	Recharge OK?	✓				
Switch/keypad	Operation	✓				
Display	Intensity	✓				
	Operation (segments)	✓				
Grill Filter	Condition	✓				
	Seal	✓				
Pump	Operation	✓				
	Filter	✓				
	Flow	✓				
	Valves, Diaphragm	✓				
PCB	Condition	✓				
Connectors	Condition	✓				
Sensor	PID	✓	10.6 ev			
Alarms	Beeper	✓	Low	High		
	Settings	✓	50ppm	100ppm		
Software	Version	✓				
Data logger	Operation					
Download	Operation	✓				
Other tests:						

### Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No	Instrument Reading
PID Lamp		100ppm Isobutylene	NIST	SY21	100.6ppm

Calibrated by:  - Jacob Arnott

Calibration date: 14/10/2013

Next calibration due: 13/11/2013

## PID Calibration Certificate

Instrument      PhoCheck Tiger  
Serial No.      T-106369



Air-Met Scientific Pty Ltd  
1300 137 067

Item	Test	Pass	Comments			
Battery	Charge Condition	✓				
	Fuses	✓				
	Capacity	✓				
	Recharge OK?	✓				
Switch/keypad	Operation	✓				
Display	Intensity	✓				
	Operation (segments)	✓				
Grill Filter	Condition	✓				
	Seal	✓				
Pump	Operation	✓				
	Filter	✓				
	Flow	✓				
	Valves, Diaphragm	✓				
PCB	Condition	✓				
Connectors	Condition	✓				
Sensor	PID	✓	10.6 ev			
Alarms	Beeper	✓	Low	High	TWA	STEL
	Settings	✓	50ppm	100ppm		
Software	Version	✓				
Data logger	Operation	✓				
Download	Operation	✓				
Other tests:						

### Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No	Instrument Reading
PID Lamp		100ppm Isobutylene	NIST	SY14	99.6ppm

Calibrated by:  Jacob Arnott

Calibration date: 23/10/2013

Next calibration due: 22/11/2013



## PID Calibration Certificate



Instrument PhoCheck Tiger  
Serial No. T-105759

Air-Met Scientific Pty Ltd  
1300 137 067

Item	Test	Pass	Comments			
Battery	Charge Condition	✓				
	Fuses	✓				
	Capacity	✓				
	Recharge OK?	✓				
Switch/keypad	Operation	✓				
Display	Intensity	✓				
	Operation (segments)	✓				
Grill Filter	Condition	✓				
	Seal	✓				
Pump	Operation	✓				
	Filter	✓				
	Flow	✓				
	Valves, Diaphragm	✓				
PCB	Condition	✓				
Connectors	Condition	✓				
Sensor	PID	✓	10.6 ev			
Alarms	Beeper	✓	Low	High	TWA	STEL
	Settings	✓	50ppm	100ppm		
Software	Version	✓				
Data logger	Operation					
Download	Operation	✓				
Other tests:						

### Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No	Instrument Reading
PID Lamp		100ppm Isobutylene	NATA	952SY	100.0ppm

Calibrated by: AR Anne Rutlidge

Calibration date: 8/10/2013

Next calibration due: 7/11/2013



# Environmental Resources Management Australia Pty Ltd

## PID Calibration Certificate

Project Name :  Project Staff :

Project No :  Date :

### Photo-ionisation Detector

Make/Model No:   
Serial Number:

### Calibration Gas

Calibration Gas:

### PID Calibration

#### Zero Calibration

PID Reading:

#### Span Calibration

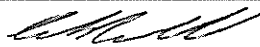
Desired PID Reading:

Actual PID Reading:

### Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

Signature:		Date:	11/10/13
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# Environmental Resources Management Australia Pty Ltd

## PID Calibration Certificate

Project Name :  Project Staff :   
Project No :  Date :

### Photo-ionisation Detector

Make/Model No:   
Serial Number:

### Calibration Gas

Calibration Gas:

### PID Calibration

#### Zero Calibration

PID Reading:

#### Span Calibration

Desired PID Reading:   
Actual PID Reading:

### Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

Signature:		Date:	14/10/13
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**ERM**

**Environmental Resources Management Australia Pty Ltd**

*PID Calibration Certificate*

Project Name :

Symphony - Mt. Piper

Project Staff :

Garin Powell

Project No :

0207428

Date :

15/10/13

**Photo-ionisation Detector**

Make/Model No:

PhoCheck TIGER

Serial Number:

7105759

**Calibration Gas**

Calibration Gas:

Isobutylene

**PID Calibration**

Zero Calibration

PID Reading:

0.0 ppm

Span Calibration

Desired PID Reading:

100 ppm

Actual PID Reading:

100.0 ppm

**Certification**

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

GP

Signature:		Date:	15/10/13
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# Environmental Resources Management Australia Pty Ltd

## PID Calibration Certificate

Project Name :  Project Staff :

Project No :  Date :

### Photo-ionisation Detector

Make/Model No:   
Serial Number:

### Calibration Gas

Callbration Gas:

### PID Calibration

#### Zero Calibration

PID Reading:

#### Span Calibration

Desired PID Reading:

Actual PID Reading:

### Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

Signature:	<input type="text" value="D. [Signature]"/>	Date:	<input type="text" value="16/10/13"/>
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# Environmental Resources Management Australia Pty Ltd

## PID Calibration Certificate

Project Name :  Project Staff :

Project No :  Date :

### Photo-ionisation Detector

Make/Model No:   
Serial Number:

### Calibration Gas

Calibration Gas:

### PID Calibration

#### Zero Calibration

PID Reading:

#### Span Calibration

Desired PID Reading:

Actual PID Reading:

### Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

Signature:	<input type="text" value="Gavin Powell"/>	Date:	<input type="text" value="17/10/13"/>
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**Environmental Resources Management Australia Pty Ltd**

*PID Calibration Certificate*

Project Name :  Project Staff :

Project No :  Date :

**Photo-ionisation Detector**

Make/Model No:   
Serial Number:

**Calibration Gas**

Calibration Gas:

**PID Calibration**

Zero Calibration

PID Reading:

Span Calibration

Desired PID Reading:   
Actual PID Reading:

**Certification**

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

Signature:		Date:	18/10/13
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ERM

# Environmental Resources Management Australia Pty Ltd

## PID Calibration Certificate

Project Name :  Project Staff :

Project No :  Date :

### Photo-ionisation Detector

Make/Model No:   
Serial Number:

### Calibration Gas

Callbration Gas:

### PID Calibration

#### Zero Callbration

PID Reading:

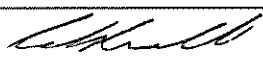
#### Span Callbration

Desired PID Reading:   
Actual PID Reading:

### Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

Signature:		Date:	<input type="text" value="28/10/13"/>
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## PID Calibration Certificate

Instrument      PhoCheck Tiger  
Serial No.      T-105762



Air-Met Scientific Pty Ltd  
1300 137 067

Item	Test	Pass	Comments			
Battery	Charge Condition	✓				
	Fuses	✓				
	Capacity	✓				
	Recharge OK?	✓				
Switch/keypad	Operation	✓				
Display	Intensity	✓				
	Operation (segments)	✓				
Grill Filter	Condition	✓				
	Seal	✓				
Pump	Operation	✓				
	Filter	✓				
	Flow	✓				
	Valves, Diaphragm	✓				
PCB	Condition	✓				
Connectors	Condition	✓				
Sensor	PID	✓	10.6 ev			
Alarms	Beeper	✓	Low	High	TWA	STEL
	Settings	✓	50ppm	100ppm		
Software	Version	✓				
Data logger	Operation					
Download	Operation	✓				
Other tests:						

### Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No	Instrument Reading
PID Lamp		100ppm Isobutylene	NIST	SY21	100.0ppm

Calibrated by: SB. Sophie Boler

Calibration date: 29/10/2013

Next calibration due: 28/11/2013



# Environmental Resources Management Australia Pty Ltd

## PID Calibration Certificate

Project Name :  Project Staff :

Project No :  Date :

### Photo-ionisation Detector

Make/Model No:   
Serial Number:

### Calibration Gas

Calibration Gas:

### PID Calibration

#### Zero Calibration

PID Reading:

#### Span Calibration

Desired PID Reading:

Actual PID Reading:

### Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

Signature:	<input type="text" value="C. Powell"/>	Date:	<input type="text" value="31/10/13"/>
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# Environmental Resources Management Australia Pty Ltd

## PID Calibration Certificate

Project Name :  Project Staff :

Project No :  Date :

### Photo-ionisation Detector

Make/Model No:   
Serial Number:

### Calibration Gas

Calibration Gas:

### PID Calibration

#### Zero Calibration

PID Reading:

#### Span Calibration

Desired PID Reading:   
Actual PID Reading:

### Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

Signature:		Date:	<input type="text" value="1/11/13"/>
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# Environmental Resources Management Australia Pty Ltd

## PID Calibration Certificate

Project Name :  Project Staff :   
Project No :  Date :

### Photo-ionisation Detector

Make/Model No:   
Serial Number:

### Calibration Gas

Calibration Gas:

### PID Calibration

#### Zero Calibration

PID Reading:

#### Span Calibration

Desired PID Reading:   
Actual PID Reading:

### Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

Signature:		Date:	1/11/13
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**Environmental Resources Management Australia Pty Ltd**

*PID Calibration Certificate*

Project Name :  Project Staff :

Project No :  Date :

**Photo-ionisation Detector**

Make/Model No:   
Serial Number:

**Calibration Gas**

Calibration Gas:

**PID Calibration**

Zero Calibration

PID Reading:

Span Calibration

Desired PID Reading:   
Actual PID Reading:

**Certification**

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

Signature:		Date:	6/11/13
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**Environmental Resources Management Australia Pty Ltd**  
*PID Calibration Certificate*

Project Name :  Project Staff :

Project No :  Date :

**Photo-ionisation Detector**

Make/Model No:

Serial Number:

**Calibration Gas**

Calibration Gas:

**PID Calibration**

Zero Calibration

PID Reading:

Span Calibration

Desired PID Reading:

Actual PID Reading:

**Certification**

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

Signature:	<input type="text" value="G.P."/>	Date:	<input type="text" value="7/11/13"/>
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# Environmental Resources Management Australia Pty Ltd

## PID Calibration Certificate

Project Name :  Project Staff :

Project No :  Date :

### Photo-ionisation Detector

Make/Model No:   
Serial Number:

### Calibration Gas

Calibration Gas:

### PID Calibration

#### Zero Calibration

PID Reading:

#### Span Calibration

Desired PID Reading:   
Actual PID Reading:

### Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

Signature:	<input type="text" value="CP"/>	Date:	<input type="text" value="8/11/13"/>
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ERM

**Environmental Resources Management Australia Pty Ltd**

*PID Calibration Certificate*

Project Name :  Project Staff :

Project No :  Date :

**Photo-ionisation Detector**

Make/Model No:   
Serial Number:

**Calibration Gas**

Calibration Gas:

**PID Calibration**

Zero Calibration

PID Reading:

Span Calibration

Desired PID Reading:   
Actual PID Reading:

**Certification**

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

Signature:	<input type="text" value="G Powell"/>	Date:	<input type="text" value="11/11/13"/>
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ERM

# Environmental Resources Management Australia Pty Ltd

## PID Calibration Certificate

Project Name : Symphony - Mt Piper Project Staff : Garin Powell

Project No : 0207423 Date : 12/11/13

### Photo-ionisation Detector

Make/Model No: Pho Check TIGER  
Serial Number: T105762

### Calibration Gas

Calibration Gas: Isobutylene

### PID Calibration

#### Zero Calibration

PID Reading: 0.0ppm

#### Span Calibration

Desired PID Reading: 100ppm

Actual PID Reading: 100.0ppm

### Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By: GP

Signature:	<u>Colin Smith</u>	Date:	<u>12/11/13</u>
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**Environmental Resources Management Australia Pty Ltd**  
*PID Calibration Certificate*

Project Name :  Project Staff :   
Project No :  Date :

**Photo-ionisation Detector**

Make/Model No:   
Serial Number:

**Calibration Gas**

Calibration Gas:

**PID Calibration**

Zero Calibration

PID Reading:

Span Calibration

Desired PID Reading:   
Actual PID Reading:

**Certification**

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

Signature:	<input type="text" value="C Powell"/>	Date:	<input type="text" value="13/11/13"/>
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**Environmental Resources Management Australia Pty Ltd**  
**PID Calibration Certificate**

Project Name :  Project Staff :

Project No :  Date :

**Photo-ionisation Detector**

Make/Model No:   
 Serial Number:

**Calibration Gas**

Calibration Gas:

**PID Calibration**

Zero Calibration

PID Reading:

Span Calibration

Desired PID Reading:   
 Actual PID Reading:

**Certification**

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

Signature:	<input type="text" value="Carvin Powell"/>	Date:	<input type="text" value="14/11/13"/>
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**Environmental Resources Management Australia Pty Ltd**  
*PID Calibration Certificate*

Project Name :  Project Staff :

Project No :  Date :

**Photo-ionisation Detector**

Make/Model No:   
Serial Number:

**Calibration Gas**

Calibration Gas:

**PID Calibration**

Zero Calibration

PID Reading:

Span Calibration

Desired PID Reading:   
Actual PID Reading:

**Certification**

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

Signature:	<input type="text" value="Garvin Powell"/>	Date:	<input type="text" value="18/11/13"/>
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**Environmental Resources Management Australia Pty Ltd**  
*PID Calibration Certificate*

Project Name :  Project Staff :   
Project No :  Date :

**Photo-ionisation Detector**

Make/Model No:   
Serial Number:

**Calibration Gas**

Calibration Gas:

**PID Calibration**

Zero Calibration

PID Reading:

Span Calibration

Desired PID Reading:   
Actual PID Reading:

**Certification**

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

Signature:	<input type="text" value="Cavin Powell"/>	Date:	<input type="text" value="19/11/13"/>
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**Environmental Resources Management Australia Pty Ltd**  
*PID Calibration Certificate*

Project Name :  Project Staff :   
 Project No :  Date :

**Photo-ionisation Detector**

Make/Model No:   
 Serial Number:

**Calibration Gas**

Calibration Gas:

**PID Calibration**

Zero Calibration

PID Reading:

Span Calibration

Desired PID Reading:   
 Actual PID Reading:

**Certification**

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

Signature:	<input type="text" value="Gavin Powell"/>	Date:	<input type="text" value="20/11/13"/>
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**Environmental Resources Management Australia Pty Ltd**  
*PID Calibration Certificate*

Project Name :  Project Staff :   
Project No :  Date :

**Photo-ionisation Detector**

Make/Model No:   
Serial Number:

**Calibration Gas**

Calibration Gas:

**PID Calibration**

Zero Calibration

PID Reading:

Span Calibration

Desired PID Reading:   
Actual PID Reading:

**Certification**

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:

Signature:	<input type="text" value="Gavin Powell"/>	Date:	<input type="text" value="27/11/13"/>
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## Multi Parameter Water Meter



Instrument **YSI Quatro Pro Plus**  
 Serial No. **13C100782**

Air-Met Scientific Pty Ltd  
 1300 137 067

Item	Test	Pass	Comments
<b>Battery</b>	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
<b>Switch/keypad</b>	Operation	✓	
<b>Display</b>	Intensity	✓	
	Operation (segments)	✓	
<b>Grill Filter</b>	Condition	✓	
	Seal	✓	
<b>PCB</b>	Condition	✓	
<b>Connectors</b>	Condition	✓	
<b>Sensor</b>	1. pH	✓	
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
<b>Alarms</b>	Beeper	✓	
	Settings	✓	
<b>Software</b>	Version	✓	
<b>Data logger</b>	Operation	✓	
<b>Download</b>	Operation	✓	
<b>Other tests:</b>			

### Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		pH 7.00		KL1376	pH 7.06
2. pH 10.00		pH 10.00		JH1569	pH 9.90
3. pH 4.00		pH 4.00		KH2094	pH 3.98
4. mV		226.3mV		KD2048/KG1100	226.2mV
5. EC		2.76mS		KJ1595	2.76mS
6. D.O		0 ppm		556	0.00ppm
7. Temp		23.5°C		MultiTherm	23.1°C

**Calibrated by:** Sophie Boler

**Calibration date:** 18/10/2013

**Next calibration due:** 16/04/2014

## Multi Parameter Water Meter



**airmet**

Air-Met Scientific Pty Ltd  
1300 137 067

Instrument YSI Quatro Pro Plus  
Serial No. 13C100782

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH	✓	
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
Alarms	Beeper	✓	
	Settings	✓	
Software	Version	✓	
Data logger	Operation	✓	
Download	Operation	✓	
Other tests:			

### Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		pH 7.00		KL1376	pH 7.05
2. pH 10.00		pH 10.00		JH1569	pH 9.83
3. pH 4.00		pH 4.00		KH2094	pH 4.03
4. mV		228.5mV		KD2048/KG1100	228.7mV
5. EC		2.76mS		KJ1595	2.76mS
6. D.O		0 ppm		689	0.00ppm
7. Temp		22.5°C		MultiTherm	22.1°C

Calibrated by:

Sophie Boler

Calibration date:

02/10/2013

Next calibration due:

31/03/2014

## Multi Parameter Water Meter



Instrument **YSI Quatro Pro Plus**  
 Serial No. **13C100783**

Air-Met Scientific Pty Ltd  
 1300 137 067

Item	Test	Pass	Comments
<b>Battery</b>	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
<b>Switch/keypad</b>	Operation	✓	
<b>Display</b>	Intensity	✓	
	Operation (segments)	✓	
<b>Grill Filter</b>	Condition	✓	
	Seal	✓	
<b>PCB</b>	Condition	✓	
<b>Connectors</b>	Condition	✓	
<b>Sensor</b>	1. pH	✓	
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
<b>Alarms</b>	Beeper	✓	
	Settings	✓	
<b>Software</b>	Version	✓	
<b>Data logger</b>	Operation	✓	
<b>Download</b>	Operation	✓	
<b>Other tests:</b>			

### Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		pH 7.00		KL1376	pH 7.06
2. pH 10.00		pH 10.00		JH1569	pH 9.90
3. pH 4.00		pH 4.00		LB2154	pH 3.99
4. mV		227.4mV		KD2048/KG1100	227.3mV
5. EC		2.76mS		KJ1595	2.76mS
6. D.O		0 ppm		939	0.00ppm
7. Temp		23.0°C		MultiTherm	22.7°C

**Calibrated by:** Sophie Boler

**Calibration date:** 13/12/2013

**Next calibration due:** 11/06/2014

## Multi Parameter Water Meter



Instrument **YSI Quatro Pro Plus**  
Serial No. **13D100015**

Air-Met Scientific Pty Ltd  
1300 137 067

Item	Test	Pass	Comments
<b>Battery</b>	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
<b>Switch/keypad</b>	Operation	✓	
<b>Display</b>	Intensity	✓	
	Operation (segments)	✓	
<b>Grill Filter</b>	Condition	✓	
	Seal	✓	
<b>PCB</b>	Condition	✓	
<b>Connectors</b>	Condition	✓	
<b>Sensor</b>	1. pH	✓	
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
<b>Alarms</b>	Beeper	✓	
	Settings	✓	
<b>Software</b>	Version	✓	
<b>Data logger</b>	Operation	✓	
<b>Download</b>	Operation	✓	
<b>Other tests:</b>			

### Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		pH 7.00		KL1376	pH 7.02
2. pH 10.00		pH 10.00		JH1569	pH 9.91
3. pH 4.00		pH 4.00		KH2094	pH 4.01
4. mV		228.5mV		KD2048/KG1100	228.4mV
5. EC		2.76mS		KJ1595	2.76mS
6. D.O		0 ppm		556	0.00ppm
7. Temp		22.5°C		MultiTherm	22.1°C

**Calibrated by:** Sophie Boler

**Calibration date:** 18/10/2013

**Next calibration due:** 16/04/2014

**SEDIMENT LOG SHEET**

PROJECT #:

**Station Information:**

Sample Location: WL-SS01  
ORIGINAL ALTERNATIVE

DUP

Date: 21/11/13

RINSATE

Water Depth: \_\_\_\_\_ Time: 10:10

**Station Location and Description:**

GPS (UTM): EASTING: \_\_\_\_\_ NORTHING: \_\_\_\_\_ AVG. ERROR: \_\_\_\_\_ marked

Description: GPS LOCATION NOT IN WATER  
SAMPLED ~15m SOUTH OF WHERE THE COX'S RIVER  
NARROWS

Notes: \_\_\_\_\_

**Sediment Characteristics:**

Sampling Method:

VAN DORN

Collection Effort:

MODERATE

		ATTEMPT #	<u>1</u>										
		penetration (cm)	<u>15</u>										
SAMPLE QUALITY	excellent												
	good												
	fair	<u>X</u>											
	poor												
COLOUR	brown												
	grey	<u>X</u>											
	black												
	reddish												
DEBRIS	shell fragments												
	shells												
	wood chips												
	twigs												
	anthropogenic												
ODOUR	HC												
	H2S												
VISUAL	sheen												

Grain Size	Approx.%
gravel	
sand	
silt	
clay	<u>25</u>
OM	

# grabs in composite: 1

BENTHOS: RED WORMS

Field staff:

CL

NOTES: TOP 1cm

DARK GREY CLAYEY SILT

Data Recorder(s):

CL

**SEDIMENT LOG SHEET**

PROJECT #:

CONSECUTIVE STN # 16

**Station Information:**

Sample Location: WL-5529  
 ORIGINAL ALTERNATIVE

DUP  
RINSATE

Date: 2/11/13  
 Water Depth: 6m Time: 11:15

**Station Location and Description:**

GPS (UTM): EASTING: \_\_\_\_\_ NORTHING: \_\_\_\_\_ AVG. ERROR: \_\_\_\_\_ marked

Description: SEE WATER NOTES

Notes: NO GRAIN SIZE COLLECTED

**Sediment Characteristics:**

		ATTEMPT #	1	2	3	4						
		penetration (cm)	5	-	-	-						
SAMPLE QUALITY	excellent											
	good											
	fair											
	poor	X										
COLOUR	brown	X										
	grey											
	black											
	reddish											
DEBRIS	shell fragments											
	shells											
	wood chips											
	twigs											
	anthropogenic											
ODOUR	HC											
	H2S											
VISUAL	sheen											

Sampling Method: VAN VEEN

Collection Effort: DIFFICULT

Grain Size	Approx. %
gravel	45
sand	45
silt	5
clay	
OM	

# grabs in composite: 1

BENTHOS: \_\_\_\_\_

Field staff: CL

NOTES: BROWN & GRAVEL SAND, TRACE SILT, SOME COBBLES

Data Recorder(s): CL



**SEDIMENT LOG SHEET**

PROJECT #:

CONSECUTIVE STN # 10

**Station Information:**

Sample Location: WL-SS02  
 ORIGINAL     ALTERNATIVE

DUP  
RINSATE

Date: 20/11/13  
 Water Depth: 1.0m    Time: 16:35

**Station Location and Description:**

GPS (UTM): EASTING: \_\_\_\_\_ NORTHING: \_\_\_\_\_ AVG. ERROR: \_\_\_\_\_ marked

Description: \_\_\_\_\_  
 \_\_\_\_\_

Notes: \_\_\_\_\_

**Sediment Characteristics:**

		ATTEMPT #	<u>15</u>								
		penetration (cm)	<u>15</u>								
SAMPLE QUALITY	excellent										
	good	<u>X</u>									
	fair										
	poor										
COLOUR	brown										
	grey										
	black										
	reddish										
DEBRIS	shell fragments										
	shells										
	wood chips										
	twigs										
	anthropogenic										
ODOUR	HC										
	H2S										
VISUAL	sheen										

Sampling Method:

VAN VEEN

Collection Effort:

MODERATE

Grain Size	Approx. %
gravel	
sand	<u>20</u>
silt	
clay	
OM	

# grabs in composite:

BENTHOS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Field staff:

CL

NOTES: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Data Recorder(s):

CL

**SEDIMENT LOG SHEET**

PROJECT #:

CONSECUTIVE STN # 9

**Station Information:**

Sample Location: WL-SS07

DUP

Date: 20/11/13

ORIGINAL ALTERNATIVE

RINSATE

Water Depth: 1.5m Time: 1555

**Station Location and Description:**

GPS (UTM): EASTING: \_\_\_\_\_ NORTHING: \_\_\_\_\_ AVG. ERROR: \_\_\_\_\_ marked

Description: ON LOCATION, MID-CHANNEL

Notes: \_\_\_\_\_

**Sediment Characteristics:**

		ATTEMPT #	<u>1</u>						
		penetration (cm)	<u>15</u>						
SAMPLE QUALITY	excellent								
	good	<u>X</u>							
	fair								
	poor								
COLOUR	brown								
	grey	<u>X</u>							
	black								
	reddish								
DEBRIS	shell fragments								
	shells								
	wood chips								
	twigs								
	anthropogenic								
ODOUR	HC								
	H2S	<u>X</u>							
VISUAL	sheen	<u>X</u>							

Sampling Method: VAN VEEN

Collection Effort: EASY

Grain Size	Approx. %
gravel	
sand	
silt	<u>90</u>
clay	<u>10</u>
OM	

# grabs in composite: 1

BENTHOS: ISOPODS

Field staff: CL

NOTES: DARK GREY SILT SOME CLAY  
ANGULAR SHEEN

Data Recorder(s): CL

**SEDIMENT LOG SHEET**

PROJECT #:

Page 1 of 1  
CONSECUTIVE STN # 14

**Station Information:**

Sample Location: WL-SS03  
 ORIGINAL     ALTERNATIVE

DUP  
RINSATE

Date: 21/11/13  
Water Depth: 1.1m    Time: 09:50

**Station Location and Description:**

GPS (UTM): EASTING:                      NORTHING:                      AVG. ERROR:                      marked

Description: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Notes: \_\_\_\_\_

**Sediment Characteristics:**

		ATTEMPT #	1										
		penetration (cm)	15										
SAMPLE QUALITY	excellent												
	good	X											
	fair												
	poor												
COLOUR	brown												
	grey												
	black	X											
	reddish												
DEBRIS	shell fragments												
	shells												
	wood chips												
	twigs												
	anthropogenic												
ODOUR	HC												
	H2S	X											
VISUAL	sheen												

Sampling Method:

VAN VEEN

Collection Effort:

EASY

Grain Size	Approx. %
gravel	
sand	
silt	90
clay	10
OM	

# grabs in composite:

1

BENTHOS: NONE OBSERVED

Field staff:

CL

NOTES: BLACK SILT SOME CLAY

SOME "G" GREY SILT OR CLAY IN TOP 2cm

Data Recorder(s):

CL

**SEDIMENT LOG SHEET**

PROJECT #:

Page 1 of 1  
CONSECUTIVE STN # 13

**Station Information:**

Sample Location: WL\_5504  
ORIGINAL ALTERNATIVE

DUP  
RINSATE

Date: 21/11/13  
Water Depth: 1.5m Time: 0940

**Station Location and Description:**

GPS (UTM): EASTING: \_\_\_\_\_ NORTHING: \_\_\_\_\_ AVG. ERROR: \_\_\_\_\_ marked

Description: ON LOCATION

Notes: \_\_\_\_\_

**Sediment Characteristics:**

	ATTEMPT #	1							
	penetration (cm)	15							
SAMPLE QUALITY	excellent								
	good	X							
	fair								
	poor								
COLOUR	brown								
	grey								
	black	X							
	reddish								
DEBRIS	shell fragments								
	shells								
	wood chips								
	twigs								
	anthropogenic								
ODOUR	HC								
	H2S	X							
VISUAL	sheen								

Sampling Method:

VAN VEEN

Collection Effort:

EASY

Grain Size	Approx. %
gravel	
sand	
silt	90
clay	10
OM	

# grabs in composite: \_\_\_\_\_

BENTHOS: \_\_\_\_\_

Field staff:

CL

NOTES: BLACK SILT SOME CLAY, TRACES OF GREY SILT

Data Recorder(s):

CL



**SEDIMENT LOG SHEET**

PROJECT #:

**Station Information:**

Sample Location: WL-SS05  
 ORIGINAL     ALTERNATIVE

DUP WL-SSB  
 RINSATE

Date: 21/11/13  
 Water Depth: 21m Time: 0920

**Station Location and Description:**

GPS (UTM): EASTING:                      NORTHING:                      AVG. ERROR:                      marked

Description: ON LOCATION

Notes:

**Sediment Characteristics:**

SAMPLE QUALITY	ATTEMPT #	<u>1</u>							
	penetration (cm)	<u>15</u>							
	excellent								
	good	<u>X</u>							
COLOUR	fair								
	poor								
	brown								
	grey								
DEBRIS	black	<u>X</u>							
	reddish								
	shell fragments								
	shells								
ODOUR	wood chips								
	twigs								
VISUAL	anthropogenic								
	HC								
	H2S	<u>X</u>							
	sheen								

Sampling Method:

VAN VEEEN

Collection Effort:

EASY

Grain Size	Approx. %
gravel	
sand	
silt	<u>90</u>
clay	<u>10</u>
OM	

# grabs in composite:

1

Field staff:

CL

Data Recorder(s):

CL

BENTHOS: NONE OBSERVED

NOTES: BLACK SILT SOME CLAY

**SEDIMENT LOG SHEET**

PROJECT #:

CONSECUTIVE STN # 11

**Station Information:**

Sample Location: WL 3508  
 ORIGINAL     ALTERNATIVE

DUP  
 RINSATE

Date: 21/11/13  
 Water Depth: 21m    Time: 0900

**Station Location and Description:**

GPS (UTM): EASTING: \_\_\_\_\_ NORTHING: \_\_\_\_\_ AVG. ERROR: \_\_\_\_\_ marked

Description: SEE WATER NOTES

Notes: \_\_\_\_\_

**Sediment Characteristics:**

		ATTEMPT #	1						
		penetration (cm)	15						
SAMPLE QUALITY	excellent								
	good	X							
	fair								
	poor								
COLOUR	brown								
	grey								
	black	X							
	reddish								
DEBRIS	shell fragments								
	shells								
	wood chips								
	twigs								
	anthropogenic								
ODOUR	HC								
	H2S	X							
VISUAL	sheen								

Sampling Method: VAN VEEN

Collection Effort: EASY

Grain Size	Approx. %
gravel	
sand	
silt	90
clay	10
OM	

# grabs in composite: 1

BENTHOS: \_\_\_\_\_

Field staff: CL

NOTES: BLACK SILT WITH SOME CLAY

Data Recorder(s): CL



**SEDIMENT LOG SHEET**

PROJECT #:

CONSECUTIVE STN # 8

**Station Information:**

Sample Location: WL-SS06  
 ORIGINAL     ALTERNATIVE

DUP  
 RINSATE

Date: 20/11/13  
 Water Depth: 1.0m    Time: 15:30

**Station Location and Description:**

GPS (UTM): EASTING:                      NORTHING:                      AVG. ERROR:                      marked

Description: ~5m EAST OF WESTERN BANK

Notes:

**Sediment Characteristics:**

		ATTEMPT #	<u>1</u>								
		penetration (cm)	<u>15</u>								
SAMPLE QUALITY	excellent										
	good	<u>X</u>									
	fair										
	poor										
COLOUR	brown										
	grey	<u>X</u>									
	black										
	reddish										
DEBRIS	shell fragments										
	shells										
	wood chips										
	twigs										
	anthropogenic										
ODOUR	HC										
	H2S										
VISUAL	sheen										

Sampling Method:

VAN VEEN

Collection Effort:

EASY

Grain Size	Approx. %
gravel	
sand	<u>8</u>
silt	<u>90</u>
clay	<u>10</u>
OM	

# grabs in composite:

1

Field staff:

CL

Data Recorder(s):

CL

BENTHOS: NONE

NOTES: DARK GREY SILT SOME CLAY

**SEDIMENT LOG SHEET**

PROJECT #:

CONSECUTIVE STN # 7

**Station Information:**

Sample Location: WL SS11  
 ORIGINAL ALTERNATIVE

DUP

Date: 20/11/13

RINSATE

Water Depth: 3.0 Time: 15:00

**Station Location and Description:**

GPS (UTM): EASTING: \_\_\_\_\_ NORTHING: \_\_\_\_\_ AVG. ERROR: \_\_\_\_\_ marked

Description: MOVED ~ 50m SW DUE TO BOOM BLOCKING BAY

Notes: \_\_\_\_\_

**Sediment Characteristics:**

		ATTEMPT #	1	2						
		penetration (cm)	10	10						
SAMPLE QUALITY	excellent									
	good									
	fair	X	X							
	poor									
COLOUR	brown									
	grey	X	X							
	black									
	reddish									
DEBRIS	shell fragments									
	shells									
	wood chips									
	twigs									
	anthropogenic									
ODOUR	HC									
	H2S									
VISUAL	sheen									

Sampling Method: VAN VEEN

Collection Effort: MODERATE

Grain Size	Approx. %
gravel	
sand	
silt	90
clay	10
OM	

# grabs in composite: 2

BENTHOS: A WORM

Field staff: CL

NOTES: DARK GREY SILT SOME CLAY

Data Recorder(s): CL



**SEDIMENT LOG SHEET**

PROJECT #:

CONSECUTIVE STN # 5

**Station Information:**

Sample Location: W1-5509

DUP

Date: 20/11/13

ORIGINAL ALTERNATIVE

RINSATE

Water Depth: 4.2m Time: 14:00

**Station Location and Description:**

GPS (UTM): EASTING: \_\_\_\_\_ NORTHING: \_\_\_\_\_ AVG. ERROR: \_\_\_\_\_ marked

Description: ~ 50m EAST OF WESTERN SHORE, 10m FROM BUOY

Notes: \_\_\_\_\_

**Sediment Characteristics:**

Sampling Method:

VAN VEEN

Collection Effort:

EASY

	ATTEMPT #	<u>1</u>							
	penetration (cm)	<u>15</u>							
SAMPLE QUALITY	excellent								
	good	<u>X</u>							
	fair								
	poor								
COLOUR	brown								
	grey	<u>X</u>							
	black								
	reddish								
DEBRIS	shell fragments								
	shells								
	wood chips								
	twigs								
	anthropogenic								
ODOUR	HC								
	H2S								
VISUAL	sheen								

Grain Size	Approx.%
gravel	
sand	
silt	<u>90</u>
clay	<u>10</u>
OM	

# grabs in composite:

1

BENTHOS: NONE

Field staff:

CL

NOTES: DARK GREY SILT WITH SOME CLAY

TOP 30mm DARKER GREY

Data Recorder(s):

CL

**SEDIMENT LOG SHEET**

PROJECT #:

CONSECUTIVE STN # 6

**Station Information:**

Sample Location: WL-SS10  
 ORIGINAL     ALTERNATIVE

DUP  
 RINSATE

Date: 20/11/13  
 Water Depth: 7.2m    Time: 14:30

**Station Location and Description:**

GPS (UTM): EASTING:                      NORTHING:                      AVG. ERROR:                      marked

Description: ~15m EAST OF POINT

Notes: \_\_\_\_\_

**Sediment Characteristics:**

		ATTEMPT #	<u>1</u>						
		penetration (cm)	<u>20</u>						
SAMPLE QUALITY	excellent	<u>X</u>							
	good								
	fair								
	poor								
COLOUR	brown								
	grey	<u>X</u>							
	black								
	reddish								
DEBRIS	shell fragments								
	shells								
	wood chips								
	twigs								
	anthropogenic								
ODOUR	HC								
	H2S	<u>X</u>							
VISUAL	sheen								

Sampling Method: VAN VEEN

Collection Effort: EASY

Grain Size	Approx. %
gravel	
sand	
silt	<u>90</u>
clay	<u>10</u>
OM	

# grabs in composite: 1

BENTHOS: NONE

Field staff: CL

NOTES: VERY DARK GREY BLACK SILT SOME CLAY

Data Recorder(s): CL



**SEDIMENT LOG SHEET**

PROJECT #:

CONSECUTIVE STN # 4

**Station Information:**

Sample Location: WLSS12  
 ORIGINAL     ALTERNATIVE

DUP  
 RINSATE

Date: 20/11/13  
 Water Depth: 6m    Time: 13:30

**Station Location and Description:**

GPS (UTM): EASTING:                      NORTHING:                      AVG. ERROR:                      marked

Description: ~15m EAST OF WESTERN SHORE

Notes: DUP WLSSA COLLECTED (METALS ONLY)

**Sediment Characteristics:**

		ATTEMPT #	<u>2</u>							
		penetration (cm)	<u>15</u>							
SAMPLE QUALITY	excellent									
	good	<u>X</u>								
	fair									
	poor									
COLOUR	brown									
	grey	<u>X</u>								
	black									
	reddish									
DEBRIS	shell fragments									
	shells									
	wood chips									
	twigs									
	anthropogenic									
ODOUR	HC									
	H2S									
VISUAL	sheen									

Sampling Method: VAN VEEN

Collection Effort: EASY

Grain Size	Approx. %
gravel	
sand	
silt	<u>90</u>
clay	<u>10</u>
OM	

# grabs in composite: 1

BENTHOS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Field staff: CL

NOTES: DARK GREY SILT & CLAY  
WITH SOME  
TOP 30mm DARKER  
1<sup>ST</sup> ATTEMPT - REFUSAL, ALGAE

Data Recorder(s): CL

**SEDIMENT LOG SHEET**

PROJECT #:

CONSECUTIVE STN # 3

**Station Information:**

Sample Location: WL 5513  
 ORIGINAL     ALTERNATIVE

DUP  
 RINSATE

Date: 20/11/13  
 Water Depth: 7.0    Time: 13:15

**Station Location and Description:**

GPS (UTM): EASTING: \_\_\_\_\_ NORTHING: \_\_\_\_\_ AVG. ERROR: \_\_\_\_\_ marked

Description: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Notes: \_\_\_\_\_

**Sediment Characteristics:**

Sampling Method: VAN VEEN

Collection Effort: EASY

Grain Size	Approx. %
gravel	
sand	
silt	<u>90</u>
clay	<u>10</u>
OM	

# grabs in composite: 1

	ATTEMPT #	<u>1</u>							
	penetration (cm)	<u>15</u>							
SAMPLE QUALITY	excellent								
	good	<u>X</u>							
	fair								
	poor								
COLOUR	brown								
	<u>DARK</u> grey	<u>X</u>							
	black								
	reddish								
DEBRIS	shell fragments								
	shells								
	wood chips								
	twigs								
	anthropogenic								
ODOUR	HC								
	H2S								
VISUAL	sheen								

BENTHOS: NONE  
 \_\_\_\_\_  
 \_\_\_\_\_

Field staff:

CL

NOTES: DARK GREY SILT WITH SOME CLAY  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Data Recorder(s):

CL



**SEDIMENT LOG SHEET**

PROJECT #: 0207460

**Station Information:**

Sample Location: WL-5514  
ORIGINAL ALTERNATIVE

DUP  
RINSATE

Date: 20/11/13  
Water Depth: 1.4m Time: 11:45

**Station Location and Description:**

GPS (UTM): EASTING: \_\_\_\_\_ NORTHING: \_\_\_\_\_ AVG. ERROR: \_\_\_\_\_ marked

Description: SOUTH END OF LAKE  
~15m NE OF REEDS

Notes: \_\_\_\_\_

**Sediment Characteristics:**

Sampling Method:

CORE

Collection Effort:

CORE

		ATTEMPT #	<u>1</u>								
		penetration (cm)	<u>15</u>								
SAMPLE QUALITY	excellent										
	good	<input checked="" type="checkbox"/>									
	fair										
	poor										
COLOUR	LIGHT brown	<input checked="" type="checkbox"/>	<u>at surf depth, Top ~5cm DARK BROWN</u>								
	grey										
	black										
	reddish	<input checked="" type="checkbox"/>	<u>reddish staining in top ~5cm</u>								
DEBRIS	shell fragments										
	shells										
	wood chips										
	<u>ROOTS</u> twigs	<input checked="" type="checkbox"/>									
	anthropogenic										
ODOUR	HC										
	H2S										
VISUAL	sheen										

Grain Size	Approx. %
gravel	
sand	<u>70</u>
silt	<u>30</u>
clay	
OM	

# grabs in composite:

2 CORES  
TOP 15cm

Field staff:

CL

Data Recorder(s):

CL

BENTHOS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

NOTES: USED 50mm CORER, BOTTOM COVERED IN  
Valisneria americana, GRAB SAMPLER NOT  
EFFECTIVE  
SILTY SAND

**SEDIMENT LOG SHEET**

PROJECT #: 0207460

Page 1 of 1  
CONSECUTIVE STN # 2

**Station Information:**

Sample Location: WL-SS15  
 ORIGINAL     ALTERNATIVE

DUP  
RINSATE

Date: 20/11/13  
 Water Depth: 6.2    Time: 0:45

**Station Location and Description:**

GPS (UTM): EASTING:                      NORTHING:                      AVG. ERROR:                      marked

Description: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Notes: \_\_\_\_\_

**Sediment Characteristics:**

	ATTEMPT #	<u>1</u>							
	penetration (cm)	<u>15</u>							
SAMPLE QUALITY	excellent								
	good	<u>X</u>							
	fair								
	poor								
COLOUR	brown								
	grey	<u>X</u>							
	black								
	reddish								
DEBRIS	shell fragments								
	shells								
	wood chips								
	twigs								
	anthropogenic								
ODOUR	HC								
	H2S								
VISUAL	sheen								

Sampling Method: VAN VEEN

Collection Effort: EASY

Grain Size	Approx. %
gravel	
sand	<u>TRACE</u>
silt	<u>90</u>
clay	
OM	

# grabs in composite: 1

BENTHOS: NONE

Field staff: CL

NOTES: ~~DARK~~ BROWNISH GREY SILT, TRACE SILT

Data Recorder(s): CL



**SEDIMENT LOG SHEET**

PROJECT #:

Page 1 of 1  
CONSECUTIVE STN # 19

**Station Information:**

Sample Location: WL\_5518

DUP

Date: 21/11/13

ORIGINAL

ALTERNATIVE

RINSATE

Water Depth: 18.2 Time: 14:45

**Station Location and Description:**

GPS (UTM): EASTING: \_\_\_\_\_ NORTHING: \_\_\_\_\_ AVG. ERROR: \_\_\_\_\_ marked

Description: AT MOUTH OF BAY IN SOUTH WEST PORTION OF LAKE

Notes: SEE COMMENT ON WATER FIELD NOTES

**Sediment Characteristics:**

Sampling Method:

VAN VEEN

Collection Effort:

MODERATE

Grain Size	Approx. %
gravel	
<i>fine</i> sand	<u>75</u>
silt	<u>90</u>
clay	<u>5</u>
OM	

# grabs in composite:

1

		ATTEMPT #	1	2	3					
		penetration (cm)	5	5	15					
SAMPLE QUALITY	excellent									
	good				X					
	fair									
	poor	X	X							
COLOUR	brown	X	X							
	grey			X						
	black									
	reddish									
DEBRIS	shell fragments									
	shells									
	wood chips									
	twigs									
	anthropogenic									
ODOUR	HC									
	H2S									
VISUAL	sheen									

BENTHOS: NONE OBSERVED

Field staff:

OL

NOTES: FIRST TWO GRABS PULLED UP COARSE BROWNISH GREY SAND, SOME SILT (DISCARDED)  
TOP ~2cm LIGHT BROWN SILT, 2-15cm DARK GREY SILT, TRACE FINE SAND & CLAY

Data Recorder(s):

CL

**SEDIMENT LOG SHEET**

PROJECT #:

CONSECUTIVE STN # 20

**Station Information:**

Sample Location: W1 S500  
 ORIGINAL     ALTERNATIVE

DUP  
RINSATE

Date: 7/11/13

Water Depth: 4.3m    Time: 15:10

**Station Location and Description:**

GPS (UTM): EASTING:                      NORTHING:                      AVG. ERROR:                      marked

Description: ON LOCATION

Notes:

**Sediment Characteristics:**

		ATTEMPT #	1	2						
		penetration (cm)	7	6						
SAMPLE QUALITY	excellent									
	good									
	fair	X	X							
	poor									
COLOUR	brown	X	X							
	grey									
	black									
	reddish									
DEBRIS	shell fragments									
	plant shells	X								
	wood chips									
	twigs	X								
	anthropogenic									
ODOUR	HC									
	H2S									
VISUAL	sheen									

Sampling Method:

VAN VEEN

Collection Effort:

ALTERNATE

Grain Size	Approx. %
gravel	
sand	75
silt	20
clay	5
OM	

# grabs in composite:

2

BENTHOS: NONE OBSERVED

Field staff:

CL

NOTES: SOME BROWN SAND  
DARK GREY SAND, SOME SILT, TRACE CLAY

Data Recorder(s):

CL

**SEDIMENT LOG SHEET**

PROJECT #:

Page 1 of 1  
CONSECUTIVE STN # 22

**Station Information:**

Sample Location: WL-SSD1  
 ORIGINAL     ALTERNATIVE

DUP  
RINSATE

Date: 21/11/13  
Water Depth: 120m Time: 16:10

**Station Location and Description:**

GPS (UTM): EASTING:                      NORTHING:                      AVG. ERROR:                      marked

Description: \_\_\_\_\_  
 \_\_\_\_\_

Notes: LOCATION NAME SWITCHED WITH WL-SS18 ON FIGURE

**Sediment Characteristics:**

		ATTEMPT #	<u>1</u>										
		penetration (cm)	<u>15</u>										
SAMPLE QUALITY	excellent												
	good	<u>X</u>											
	fair												
	poor												
COLOUR	brown												
	<u>DARK</u> grey	<u>X</u>											
	black												
	reddish												
DEBRIS	shell fragments												
	shells												
	wood chips												
	twigs												
	anthropogenic												
ODOUR	HC												
	H2S	<u>X</u>											
VISUAL	sheen												

Sampling Method:

VAN VEEN

Collection Effort:

EASY

Grain Size	Approx. %
gravel	
sand	
silt	<u>90</u>
clay	<u>10</u>
OM	

# grabs in composite:

1

BENTHOS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Field staff:

CL

NOTES: DARK GREY SILT, SOME CLAY  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Data Recorder(s):

CL

**SEDIMENT LOG SHEET**

PROJECT #:

CONSECUTIVE STN # 21

**Station Information:**

Sample Location: WL-PS19  
 ORIGINAL  ALTERNATIVE

DUP ~~WLS19~~ Date: 21/11/13  
 RINSATE WL-SSC Water Depth: 14.2m Time: 15:30  
 OF PONAR

**Station Location and Description:**

GPS (UTM): EASTING: \_\_\_\_\_ NORTHING: \_\_\_\_\_ AVG. ERROR: \_\_\_\_\_ marked

Description: ON LOCATION

Notes: \_\_\_\_\_

**Sediment Characteristics:**

	ATTEMPT #	1	2	3					
	penetration (cm)	6	5	6					
SAMPLE QUALITY	excellent								
	good								
	fair	X		X					
	poor		X						
COLOUR	brown								
	grey	X	X	X					
	black								
	reddish								
DEBRIS	shell fragments								
	shells								
	wood chips								
	twigs								
	anthropogenic								
ODOUR	HC								
	H2S								
VISUAL	sheen								

Sampling Method: VAN VEEN

Collection Effort: MODERATE

Grain Size	Approx. %
gravel	
sand	
silt	10
clay	80
OM	

# grabs in composite: 3

BENTHOS: \_\_\_\_\_

Field staff: CL

NOTES: TOP 1cm LIGHT GREY SILT  
1-6cm DARK GREY CLAY SOME SILT &  
SOME COBBLES (NOT INCL. IN GRAIN SIZE  
SAMPLE

Data Recorder(s): CL



**SEDIMENT LOG SHEET**

PROJECT #:

CONSECUTIVE STN # \_\_\_\_\_

**Station Information:**

Sample Location: WL-SS23

DUP

Date: 26.11.13

ORIGINAL ALTERNATIVE

RINSATE

Water Depth: \_\_\_\_\_ Time: \_\_\_\_\_

**Station Location and Description:**

GPS (UTM): EASTING: 6209385 NORTHING: 6298772 AVG. ERROR: \_\_\_\_\_ marked

Description: Southern bank, inside bend of Tortuous watercourse

Notes: \_\_\_\_\_

**Sediment Characteristics:**

		ATTEMPT #	1										
		penetration (cm)	5										
SAMPLE QUALITY	excellent	X											
	good												
	fair												
	poor												
COLOUR	brown	X											
	grey	X											
	black	X											
	reddish												
DEBRIS	shell fragments												
	shells												
	wood chips												
	twigs												
	anthropogenic												
ODOUR	HC												
	H2S												
VISUAL	sheen												

Sampling Method:

Petite Ponar

Collection Effort:

Grain Size	Approx. %
gravel	
sand	
silt	
clay	
OM	

# grabs in composite:

3

Field staff:

AA + GP

Data Recorder(s):

GP

BENTHOS: \_\_\_\_\_

NOTES: Black silty clay, saturated

**SEDIMENT LOG SHEET**

PROJECT #:

CONSECUTIVE STN # \_\_\_\_\_

**Station Information:**

Sample Location: WL-SS24  
 ORIGINAL      ALTERNATIVE

DUP  
 RINSATE

Date: 26.11.13  
 Water Depth: 0.5 Time: 13:00

**Station Location and Description:**

GPS (UTM): EASTING: 0229272    NORTHING: 6298507    AVG. ERROR:    marked

Description: Plot immediately u/s of pond, d/c of pipe under road - To/From Watercourse.

Notes: \_\_\_\_\_

**Sediment Characteristics:**

SAMPLE QUALITY	ATTEMPT #	1							
	penetration (cm)	7							
	excellent								
	good	X							
COLOUR	fair								
	poor								
	brown								
	grey								
DEBRIS	black	X							
	reddish								
	shell fragments								
	shells								
ODOUR	wood chips								
	grass/stwigs	X							
	anthropogenic								
VISUAL	HC								
	H2S	X							
VISUAL		sheen							

Sampling Method: White Ponar

Collection Effort: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Grain Size	Approx. %
gravel	
sand	
silt	
clay	
OM	

# grabs in composite: 1

BENTHOS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Field staff: AA/ap

NOTES: Black silty clay, saturated, organic matter (5%) (weeds/roots).  
 Organic odour.

Data Recorder(s): AA

**SEDIMENT LOG SHEET**

PROJECT #:

CONSECUTIVE STN # \_\_\_\_\_

**Station Information:**

Sample Location: WL-SS25

DUP

Date: 26.11.13

ORIGINAL ALTERNATIVE

RINSATE

Water Depth: 0.5m. Time: 11:50

**Station Location and Description:**

GPS (UTM): EASTING: \_\_\_\_\_ NORTHING: \_\_\_\_\_ AVG. ERROR: \_\_\_\_\_ marked

Description: Pond on tortuous watercourse

Notes: \_\_\_\_\_

**Sediment Characteristics:**

	ATTEMPT #	1	2						
	penetration (cm)	7	5						
SAMPLE QUALITY	excellent								
	good	X							
	fair								
	poor		X						
COLOUR	brown								
	grey								
	black	X	X						
	reddish								
DEBRIS	shell fragments								
	shells								
	wood chips								
	<u>rocks - twigs</u>	X	X						
	anthropogenic								
ODOUR	HC								
	H2S	X							
VISUAL	sheen								

Sampling Method:

Petite Ponar

Collection Effort:

Grain Size	Approx. %
gravel	
sand	
silt	
clay	
OM	

# grabs in composite:

BENTHOS: \_\_\_\_\_

Field staff:

AA / ad

NOTES:

Black silty clay, saturated, organic matter (20%) (rocks), strong H<sub>2</sub>S odour

Data Recorder(s):

AA

**SEDIMENT LOG SHEET**

PROJECT #:

CONSECUTIVE STN # \_\_\_\_\_

**Station Information:**

Sample Location: WIL-SS 26  
 ORIGINAL     ALTERNATIVE

DUP

Date: 26.11.13

RINSATE

Water Depth: 0.5m    Time: 11:30

**Station Location and Description:**

GPS (UTM): EASTING: \_\_\_\_\_ NORTHING: \_\_\_\_\_ AVG. ERROR: \_\_\_\_\_ marked

Description: Pond at tortoise waterouse. u/s end.

Notes: \_\_\_\_\_

**Sediment Characteristics:**

Sampling Method: Petite Ponar.

Collection Effort: \_\_\_\_\_

		ATTEMPT #	1	2						
		penetration (cm)	5	5						
SAMPLE QUALITY	excellent									
	good			X						
	fair									
	poor	Y								
COLOUR	brown									
	grey									
	black	X	X							
	reddish									
DEBRIS	shell fragments									
	shells									
	wood chips									
	twigs									
	anthropogenic									
ODOUR	HC									
	H2S	X	X							
VISUAL	sheen	X	X							

Grain Size	Approx. %
gravel	
sand	
silt	
clay	
OM	

# grabs in composite: \_\_\_\_\_

BENTHOS: \_\_\_\_\_

Field staff: AA/AP

NOTES: Black & clayey silt, organic matter (10-20%), organic odour.

Data Recorder(s): AA

**SEDIMENT LOG SHEET**

PROJECT #:

**Station Information:**

Sample Location: WL-SS30  
 ORIGINAL     ALTERNATIVE

DUP  
RINSATE

Date: 21/11/13  
Water Depth: 1.0m    Time: 11:30

**Station Location and Description:**

GPS (UTM): EASTING:                      NORTHING:                      AVG. ERROR:                      marked

Description: SAMPLED FROM EDGE OF CHANNEL WITH CORE

Notes:

**Sediment Characteristics:**

Sampling Method:

CORER

Collection Effort:

MODERATE

		ATTEMPT #	1	2	COLE	CORR						
		penetration (cm)	-	-	15	15						
SAMPLE QUALITY	excellent											
	good											
	fair											
	poor											
COLOUR	brown				X	X						
	grey											
	black											
	reddish											
DEBRIS	shell fragments											
	shells											
	<sup>root etc</sup> wood chips				X	X						
	twigs											
	anthropogenic											
ODOUR	HC											
	H2S											
VISUAL	sheen											

Grain Size	Approx. %
gravel	
sand	
silt	<u>95</u>
clay	<u>5</u>
OM	

cores  
# grabs in composite:  
2

BENTHOS:

Field staff:

CL

NOTES: BROWN SILT IN TIGHT ROOTLET MATRIX

Data Recorder(s):

CL

**SEDIMENT LOG SHEET**

PROJECT #:

CONSECUTIVE STN # 18

**Station Information:**

Sample Location: WL 5531  
 ORIGINAL     ALTERNATIVE

DUP  
RINSATE

Date: 21/11/30  
 Water Depth: 59m    Time: 12:00

**Station Location and Description:**

GPS (UTM): EASTING:                      NORTHING:                      AVG. ERROR:                      marked

Description: ~20m SOUTH OF RAIL BRIDGE, MIDDLE OF CHANNE L

Notes: \_\_\_\_\_

**Sediment Characteristics:**

		ATTEMPT #	1							
		penetration (cm)	15							
SAMPLE QUALITY	excellent									
	good	X								
	fair									
	poor									
COLOUR	brown	X								
	grey									
	black									
	reddish									
DEBRIS	shell fragments									
	shells									
	wood chips									
	twigs									
	anthropogenic									
ODOUR	HC									
	H2S									
VISUAL	sheen									

Sampling Method: VAN VEEN

Collection Effort: EASY

Grain Size	Approx. %
gravel	5
sand	70
silt	20
clay	
OM	

# grabs in composite: 1

BENTHOS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Field staff: CL

NOTES: GREYISH BROWN SAND, SOME SILT, TRACE GRAVEL

Data Recorder(s): CL



**SEDIMENT LOG SHEET**

PROJECT #:

CONSECUTIVE STN # \_\_\_\_\_

**Station Information:**

Sample Location: WL-5536  
 ORIGINAL      ALTERNATIVE

DUP  
 RINSATE

Date: 25/11/13  
 Water Depth: \_\_\_\_\_ Time: 11:50

**Station Location and Description:**

GPS (UTM): EASTING: \_\_\_\_\_ NORTHING: \_\_\_\_\_ AVG. ERROR: \_\_\_\_\_ marked

Description: Lidsdale cut

Notes: \_\_\_\_\_

**Sediment Characteristics:**

Sampling Method: White cone

Collection Effort: \_\_\_\_\_

	ATTEMPT #	1											
	penetration (cm)												
SAMPLE QUALITY	excellent												
	good												
	fair	X											
	poor												
COLOUR	brown	✓											
	grey												
	black												
	reddish												
DEBRIS	shell fragments												
	shells												
	wood chips												
	twigs	X/100											
	anthropogenic												
ODOUR	HC												
	H2S												
VISUAL	sheen												

Grain Size	Approx. %
gravel	1
sand	2
silt	17
clay	40/80
OM	

# grabs in composite: \_\_\_\_\_

BENTHOS: \_\_\_\_\_

Field staff: AA/CL

NOTES: yellow-brown, silty clay/ fine needles, gravels (2%),  
Reeds around pond stained brown-red colour at water level.

Data Recorder(s): AA

**SEDIMENT LOG SHEET**

PROJECT #:

CONSECUTIVE STN # \_\_\_\_\_

**Station Information:**

Sample Location: WL 587

DUP

Date: 25/11/13

ORIGINAL ALTERNATIVE

RINSATE

Water Depth: \_\_\_\_\_ Time: 12:30

**Station Location and Description:**

GPS (UTM): EASTING: 0229530

NORTHING: 6302175

AVG. ERROR:

marked

Description: \_\_\_\_\_

Notes: \_\_\_\_\_

**Sediment Characteristics:**

Sampling Method: \_\_\_\_\_

Collection Effort: \_\_\_\_\_

		ATTEMPT #	1	2								
		penetration (cm)	5	5								
SAMPLE QUALITY	excellent											
	good	X	X									
	fair											
	poor											
COLOUR	brown	X	X									
	grey											
	black											
	reddish											
DEBRIS	shell fragments											
	shells											
	wood chips											
	twigs											
	anthropogenic											
ODOUR	HC											
	H2S											
VISUAL	sheen											

Grain Size	Approx. %
gravel	
sand	
silt	
clay	
OM	

# grabs in composite: \_\_\_\_\_

BENTHOS: \_\_\_\_\_

Field staff: \_\_\_\_\_

NOTES: brown silty clay, saturated organic matter (10%)

Data Recorder(s): \_\_\_\_\_

**SEDIMENT LOG SHEET**

PROJECT #:

CONSECUTIVE STN # \_\_\_\_\_

**Station Information:**

Sample Location: WL-SS38

DUP

Date: 25-11-12

ORIGINAL ALTERNATIVE

RINSATE

Water Depth: \_\_\_\_\_ Time: 12:45

**Station Location and Description:**

GPS (UTM): EASTING: 0229679

NORTHING: 6302226

AVG. ERROR:

marked

Description: \_\_\_\_\_

Notes: \_\_\_\_\_

**Sediment Characteristics:**

Sampling Method: \_\_\_\_\_

Collection Effort: \_\_\_\_\_

	ATTEMPT #	<u>1</u>	<u>2</u>										
	penetration (cm)	<u>7</u>	<u>4</u>										
SAMPLE QUALITY	excellent												
	good	<u>x</u>	<u>x</u>										
	fair												
	poor												
COLOUR	brown	<u>✓</u>	<u>x</u>										
	grey												
	black												
	reddish												
DEBRIS	shell fragments												
	shells												
	wood chips												
	twigs	<u>x</u>	<u>x</u>										
	anthropogenic												
ODOUR	HC												
	H2S												
VISUAL	sheen												

Grain Size	Approx. %
gravel	
sand	
silt	
clay	
OM	

# grabs in composite: \_\_\_\_\_

BENTHOS: \_\_\_\_\_

Field staff: AA/CC

NOTES: Brown sandy clay, saturated, organic matter (10%),  
gravel (5%).

Data Recorder(s): AA

WL-SSD = duplicate.

**SEDIMENT LOG SHEET**

PROJECT #:

CONSECUTIVE STN # \_\_\_\_\_

**Station Information:**

Sample Location: NL-SS22

DUP

Date: 25.11.13

ORIGINAL      ALTERNATIVE

RINSATE

Water Depth: \_\_\_\_\_ Time: 2:45 pm

**Station Location and Description:**

GPS (UTM): EASTING: 0229446

NORTHING: 6299142

AVG. ERROR: 2m

marked

Description: Tortuous watercourse

Notes: \_\_\_\_\_

**Sediment Characteristics:**

		ATTEMPT #	1							
		penetration (cm)	8							
SAMPLE QUALITY	excellent	X								
	good									
	fair									
	poor									
COLOUR	brown	X								
	grey									
	black									
	reddish									
DEBRIS	shell fragments									
	shells									
	wood chips									
	twigs									
	anthropogenic									
ODOUR	HC									
	H2S									
VISUAL	sheen									

Sampling Method:

Petite Ponar

Collection Effort:

Grain Size	Approx. %
gravel	
sand	
silt	
clay	
OM	

# grabs in composite:

1

BENTHOS: \_\_\_\_\_

Field staff:

CL/AA

NOTES:

Grey, clayey silt, saturated, organic matter (15%)

Data Recorder(s):

AA

NL-SS F = Duplicate

**SEDIMENT LOG SHEET**

PROJECT #:

Page 1 of 1  
CONSECUTIVE STN # 24

**Station Information:**

Sample Location: WL-SS39  
 ORIGINAL     ALTERNATIVE

DUP  
RINSATE

Date: 22/11/13  
Water Depth: 7.5m    Time: 09:40

**Station Location and Description:**

GPS (UTM): EASTING: \_\_\_\_\_ NORTHING: \_\_\_\_\_ AVG. ERROR: \_\_\_\_\_ marked

Description: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Notes: \_\_\_\_\_

**Sediment Characteristics:**

		ATTEMPT #	<u>1</u>							
		penetration (cm)	<u>15</u>							
SAMPLE QUALITY	excellent									
	good	<u>X</u>								
	fair									
	poor									
COLOUR	brown	<u>X</u>								
	grey	<u>X</u>								
	black									
	reddish									
DEBRIS	shell fragments									
	shells									
	wood chips	<u>X</u>								
	twigs	<u>X</u>								
	roots anthropogenic	<u>X</u>								
ODOUR	HC									
	H2S									
VISUAL	sheen									

Sampling Method:

VAN VEEN

Collection Effort:

EASY

Grain Size	Approx. %
gravel	
sand	<u>5</u>
silt	<u>90</u>
clay	<u>5</u>
OM	

# grabs in composite:

1

BENTHOS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Field staff:

CL

NOTES: LIGHT BROWN SILT (TOP 2cm) UNDERLAIN BY DARK GREY SILT, TRACE CLAY & SAND WITH WOODY DEBRIS & ROOTS

Data Recorder(s):

CL

**SEDIMENT LOG SHEET**

PROJECT #:

CONSECUTIVE STN # 23

**Station Information:**

Sample Location: WL SS40  
 ORIGINAL      ALTERNATIVE

DUP WL-SSC      Date: 22/11/13  
 RINSATE      Water Depth: 110m      Time: 09:20

**Station Location and Description:**

GPS (UTM): EASTING:      NORTHING:      AVG. ERROR:      marked

Description: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Notes: \_\_\_\_\_

**Sediment Characteristics:**

SAMPLE QUALITY	ATTEMPT #	1								
	penetration (cm)	8								
	excellent									
	good									
COLOUR	fair	X								
	poor									
	brown	X								
	grey									
DEBRIS	black									
	reddish									
	shell fragments									
	shells									
	wood chips									
ODOUR	twigs									
	anthropogenic									
	HC									
VISUAL	H2S									
	sheen									

Sampling Method: VAN VEEN

Collection Effort: EASY

Grain Size	Approx. %
gravel	20
sand	60
silt	20
clay	
OM	

# grabs in composite: 1

BENTHOS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Field staff: CL

NOTES: 1 LIGHT BROWN SILT, SOME REDDISH STAINING  
IN TOP 3cm UNDERLAIN BY COARSE BROWN  
SAND & GRAVEL

Data Recorder(s): CL



**SEDIMENT LOG SHEET**

PROJECT #:

Page 1 of 1  
CONSECUTIVE STN # 25

**Station Information:**

Sample Location: W1-SS41  
 ORIGINAL     ALTERNATIVE

DUP  
RINSATE

Date: 22/11/13  
 Water Depth: 12.0m Time: 10:06

**Station Location and Description:**

GPS (UTM): EASTING: \_\_\_\_\_ NORTHING: \_\_\_\_\_ AVG. ERROR: \_\_\_\_\_ marked

Description: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Notes: \_\_\_\_\_  
 \_\_\_\_\_

**Sediment Characteristics:**

Sampling Method: VAN VEEN

Collection Effort: DIFFICULT

Grain Size	Approx. %
gravel	
sand	
silt	
clay	
OM	

# grabs in composite: \_\_\_\_\_

		ATTEMPT #	1	2	3	4	5	6				
		penetration (cm)	-	4	-	5	-	-				
SAMPLE QUALITY	excellent											
	good											
	fair				X							
	poor		X									
COLOUR	brown											
	grey											
	black											
	reddish											
DEBRIS	shell fragments											
	shells											
	wood chips											
	twigs											
	anthropogenic											
ODOUR	HC											
	H2S											
VISUAL	sheen											

BENTHOS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Field staff: CL

NOTES: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Data Recorder(s): CL

**SEDIMENT LOG SHEET**

PROJECT #:

CONSECUTIVE STN # \_\_\_\_\_

**Station Information:**

Sample Location: WL-SS35

DUP

Date: 25/11/13

ORIGINAL ALTERNATIVE

RINSATE

Water Depth: 30cm Time: 10.45am

**Station Location and Description:**

GPS (UTM): EASTING: 0229344

NORTHING: 6302424

AVG. ERROR:

marked

Description: \_\_\_\_\_

Notes: \_\_\_\_\_

**Sediment Characteristics:**

		ATTEMPT #	1	2	3	4						
		penetration (cm)	-	-	-	4						
SAMPLE QUALITY	excellent											
	good											
	fair											
	poor					x						
COLOUR	brown					x						
	grey					x						
	black											
	reddish											
DEBRIS	shell fragments											
	shells											
	wood chips											
	twigs					pine						
	anthropogenic											
ODOUR	HC											
	H2S											
VISUAL	sheen											

Sampling Method:

Petite Ponar

Collection Effort:

Difficult.

Grain Size	Approx. %
gravel	
sand	5
silt	20
clay	70
OM	5

# grabs in composite:

BENTHOS: \_\_\_\_\_

Field staff:

AA/CL

NOTES: 1cm - light brown sandy clay; underlain dark grey, organic matter 15% (pine needles).

Data Recorder(s):

AA

**SURFACE WATER FIELD NOTES**

PROJECT #:

**Station Information:**

Sample Location: WLSS07 DUP Date: 20/11/13  
 Depth Sampled: 0.5 Time: 1550

**Station Location and Description:**

GPS (UTM): EASTING: NORTHING: AVG. ERROR: marked

Description: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Notes: \_\_\_\_\_  
 \_\_\_\_\_

**Field Parameters:**

PARAMETER	
pH	8.90
Conductivity	97.2 $\mu S/cm$
Temperature	22.80°C
DO	11.10 mg/L
ORP	100 mV
Turbidity TDS	661 mg/L

COLOUR: CLEAR  
 SHEEN?: N  
 NOTES: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Sampling Method: VAN DORN  
 Field staff: CL  
 Data Recorder(s): CL

**Station Information:**

Sample Location: WLSS02 DUP Date: 20/11/13  
 Depth Sampled: 0.5 Time: 1630

**Station Location and Description:**

GPS (UTM): EASTING: NORTHING: AVG. ERROR: marked

Description: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Notes: \_\_\_\_\_  
 \_\_\_\_\_

**Field Parameters:**

PARAMETER	
pH	8.60
Conductivity	112.5 $\mu S/cm$
Temperature	24.3°C
DO	9.48 mg/L
ORP	84.4 mV
Turbidity TDS	729 mg/L

COLOUR: CLEAR  
 SHEEN?: N  
 NOTES: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Sampling Method: VAN DORN  
 Field staff: CL  
 Data Recorder(s): CL



**SURFACE WATER FIELD NOTES**

PROJECT #:

**Station Information:**

Sample Location: WL 5530 DUP Date: 21/11/13  
 Depth Sampled: 05m Time: 11:30

**Station Location and Description:**

GPS (UTM): EASTING: NORTHING: AVG. ERROR: marked

Description: ~10m N OF WALKING BRIDGE

Notes:

**Field Parameters:**

PARAMETER	
pH	8.48
Conductivity	1146 $\mu$ S/cm
Temperature	19.9°C
DO	8.0
ORP	102.9 V
Turbidity TDS	744 mg/L

COLOUR: CLEAR  
 SHEEN?: N  
 NOTES:

Sampling Method: VAN DORN  
 Field staff: CL  
 Data Recorder(s): CL

**Station Information:**

Sample Location: WL 5531 DUP Date: 21/11  
 Depth Sampled: 50m Time: 12:10

**Station Location and Description:**

GPS (UTM): EASTING: NORTHING: AVG. ERROR: marked

Description: ~30m SOUTH OF RAIL BRIDGE

Notes:

**Field Parameters:**

PARAMETER	
pH	8.38
Conductivity	1138 $\mu$ S/cm
Temperature	19.5°C
DO	7.58 mg/L
ORP	101.5 mV
Turbidity TDS	739 mg/L

COLOUR: CLEAR  
 SHEEN?: N  
 NOTES:

Sampling Method: VAN DORN  
 Field staff: CL  
 Data Recorder(s): CL

**SURFACE WATER FIELD NOTES**

PROJECT #:

**Station Information:**

Sample Location: WL-SS04

DUP

Date: 21/11/12

Depth Sampled: 0.8 Time: 0940

**Station Location and Description:**

GPS (UTM): EASTING: \_\_\_\_\_ NORTHING: \_\_\_\_\_ AVG. ERROR: \_\_\_\_\_ marked

Description: ~50m EAST OF WESTERN SHORE

Notes: \_\_\_\_\_

**Field Parameters:**

PARAMETER	
pH	<u>9.01</u>
Conductivity	<u>1069 <math>\mu</math>S/cm</u>
Temperature	<u>20.9 <math>^{\circ}</math>C</u>
DO	<u>11.38 mg/L</u>
ORP	<u>98.2 mV</u>
Turbidity TDS	<u>695 mg/L</u>

COLOUR: CLEAR

SHEEN?: N

NOTES: \_\_\_\_\_

Sampling Method:

VAN DORN

Field staff:

CL

Data Recorder(s):

CL

**Station Information:**

Sample Location: WL-SS03

DUP

Date: 21/11/12

Depth Sampled: 0.5 Time: 0950

**Station Location and Description:**

GPS (UTM): EASTING: \_\_\_\_\_ NORTHING: \_\_\_\_\_ AVG. ERROR: \_\_\_\_\_ marked

Description: \_\_\_\_\_

Notes: \_\_\_\_\_

**Field Parameters:**

PARAMETER	
pH	<u>8.67</u>
Conductivity	<u>1038 <math>\mu</math>S/cm</u>
Temperature	<u>21.0 <math>^{\circ}</math>C</u>
DO	<u>8.25 mg/L</u>
ORP	<u>102.5 mV</u>
Turbidity TDS	<u>737 mg/L</u>

COLOUR: CLEAR

SHEEN?: N

NOTES: \_\_\_\_\_

Sampling Method:

VAN D

Field staff:

CL

Data Recorder(s):

CL

**SURFACE WATER FIELD NOTES**

PROJECT #:

**Station Information:**

Sample Location: WL 5501

DUP

Date: 21/11/13

Depth Sampled: 0.5m Time: 10:10

**Station Location and Description:**

GPS (UTM): EASTING:

NORTHING:

AVG. ERROR:

marked

Description: IN SHALLOW BAY ON WEST SIDE OF MOUTH OF COX'S RIVER

Notes:

**Field Parameters:**

PARAMETER	
pH	<u>8.51</u>
Conductivity	<u>161 <math>\mu</math>S/cm</u>
Temperature	<u>21.5°C</u>
DO	<u>6.57 mg/L</u>
ORP	<u>103.9 mV</u>
Turbidity	<u>7.54 mg/L</u>

COLOUR: CLEAR

SHEEN?: N

NOTES:

Sampling Method:

VAN DORN

Field staff:

CL

Data Recorder(s):

CL

**Station Information:**

Sample Location: WL 5529

DUP

Date: 21/11/13

RINSATE WL-558

Depth Sampled: 5.0m Time: 11:00

**Station Location and Description:**

GPS (UTM): EASTING:

NORTHING:

AVG. ERROR:

marked

Description: ON SOUTH SIDE OF <sup>ROAD</sup> BRIDGE (~10m FROM BRIDGE)  
CENTRE OF CHANNEL

Notes: RINSATE COLLECTED FROM VAN DORN AFTER WL 5529 COLLECTED

**Field Parameters:**

PARAMETER	
pH	<u>8.44</u>
Conductivity	<u>115.9 <math>\mu</math>S/cm</u>
Temperature	<u>19.2°C</u>
DO	<u>9.03 mg/L</u>
ORP	<u>98.8 mV</u>
Turbidity	<u>7.54 mg/L</u>

COLOUR: CLEAR

SHEEN?: N

NOTES:

Sampling Method:

VAN DORN

Field staff:

CL

Data Recorder(s):

CL



**SURFACE WATER FIELD NOTES**

PROJECT #:

**Station Information:**

Sample Location: WL-SS41

DUP

Date: 22/11/13

Depth Sampled: 8.5 Time: 1000

**Station Location and Description:**

GPS (UTM): EASTING: \_\_\_\_\_ NORTHING: \_\_\_\_\_ AVG. ERROR: \_\_\_\_\_ marked

Description: 30m from shore

Notes: \_\_\_\_\_

**Field Parameters:**

PARAMETER	
pH	8.33
Conductivity	477 $\mu S/cm$
Temperature	15.4
DO	10.06 $mg/L$
ORP	158.2 $V$
Turbidity TDS	316 $mg/L$

COLOUR: CLEAR

SHEEN?: N

NOTES: \_\_\_\_\_

Sampling Method:

VAN DORN

Field staff:

CL

Data Recorder(s):

CL

**Station Information:**

Sample Location: WL-SS35

DUP

Date: 25/11/13

Depth Sampled: 0.5m Time: 10.35

**Station Location and Description:**

GPS (UTM): EASTING: \_\_\_\_\_ NORTHING: \_\_\_\_\_ AVG. ERROR: \_\_\_\_\_ marked

Description: Adjacent to former discharge point from Lidsdale Cut into sawyers Swamp Creek

Notes: \_\_\_\_\_

**Field Parameters:**

PARAMETER	
pH	7.90
Conductivity	1163 $ms/cm$
Temperature	21.8°C
DO	8.22 $mg/L$
ORP	131.6
Turbidity TDS	755 $mg/L$

COLOUR: Colourless, clear.

SHEEN?: No

NOTES: \_\_\_\_\_

Sampling Method:

VAN DORN

Field staff:

CL AA

Data Recorder(s):

AA

**SURFACE WATER FIELD NOTES**

PROJECT #:

**Station Information:**

Sample Location: WL-SS38 DUP Date: 25.11.13  
 Depth Sampled: \_\_\_\_\_ Time: 12.45

**Station Location and Description:**

GPS (UTM): EASTING: \_\_\_\_\_ NORTHING: \_\_\_\_\_ AVG. ERROR: \_\_\_\_\_ marked   
 Description: Swampers Swamp Creek, downstream KVAR, upstream coal haul road  
 Notes: \_\_\_\_\_

**Field Parameters:**

PARAMETER	
pH	8.13
Conductivity	1174 mS/cm
Temperature	24.30C
DO	7.13 mg/L
ORP	99.4 mV
Turbidity TDS	764 mg/L

COLOUR: \_\_\_\_\_  
 SHEEN?: \_\_\_\_\_  
 NOTES: \_\_\_\_\_  
 Sampling Method: Petite Ponar  
 Field staff: AA/CL  
 Data Recorder(s): AA

**Station Information:**

Sample Location: WL-SS22 DUP Date: 25.11.13  
 Depth Sampled: \_\_\_\_\_ Time: 2.40 pm

**Station Location and Description:**

GPS (UTM): EASTING: \_\_\_\_\_ NORTHING: \_\_\_\_\_ AVG. ERROR: \_\_\_\_\_ marked   
 Description: Tortuous watercourse immediately d/stream of outlet.  
 Notes: \_\_\_\_\_

**Field Parameters:**

PARAMETER	
pH	7.40
Conductivity	1514
Temperature	24.20C
DO	8.69
ORP	107.7
Turbidity TDS	984

COLOUR: \_\_\_\_\_  
 SHEEN?: \_\_\_\_\_  
 NOTES: \_\_\_\_\_  
 Sampling Method: \_\_\_\_\_  
 Field staff: AA/CL  
 Data Recorder(s): AA

**SURFACE WATER FIELD NOTES**

PROJECT #:

**Station Information:**

Sample Location: WL-SS24

DUP

Date: 26.11.13

Depth Sampled: 0.5m Time: 13:00

**Station Location and Description:**

GPS (UTM): EASTING: \_\_\_\_\_ NORTHING: \_\_\_\_\_ AVG. ERROR: \_\_\_\_\_ marked

Description: \_\_\_\_\_

Notes: \_\_\_\_\_

**Field Parameters:**

Sampling Method: \_\_\_\_\_

PARAMETER	
pH	8.5
Conductivity	131.8
Temperature	23.3°C
DO	8.3
ORP	72.5
Turbidity TDS	

COLOUR: Colourless.

SHEEN?: No Sheen.

NOTES: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Field staff: AA/AP.

Data Recorder(s): AA

**Station Information:**

Sample Location: WL-SS28

DUP

Date: 12/12/13

Depth Sampled: 0.5m Time: \_\_\_\_\_

**Station Location and Description:**

GPS (UTM): EASTING: 228641.22 NORTHING: 6300676.94 AVG. ERROR: \_\_\_\_\_ marked

Description: Cox River inside Wallerawang P/Station, downstream of concrete Rd.

Notes: Re-sampled on 19/12/14. Sample labelled "WL-SS27-W".

**Field Parameters:**

Sampling Method: \_\_\_\_\_

PARAMETER	
pH	
Conductivity	
Temperature	
DO	
ORP	
Turbidity	

COLOUR: Colourless

SHEEN?: No Sheen.

NOTES: Field parameters not recorded

Field staff: AA

Data Recorder(s): \_\_\_\_\_

**SURFACE WATER FIELD NOTES**

PROJECT #:

**Station Information:**

Sample Location: W6-SS16

DUP

Date: 26.11.13

Depth Sampled: 0.5 Time: 14:45

**Station Location and Description:**

GPS (UTM): EASTING: 0228509 NORTHING: 6297740 AVG. ERROR: \_\_\_\_\_ marked

Description: Coxs River d/s Lake Wallaw d/s bridge

Notes: \_\_\_\_\_

**Field Parameters:**

PARAMETER	
pH	<u>8.85</u>
Conductivity	<u>805 uS</u>
Temperature	<u>20.5 °C</u>
DO	<u>9.81 mg/L</u>
ORP	<u>131.0 mV</u>
Turbidity	<u>—</u>

COLOUR: clear colourless

SHEEN?: no

NOTES: \_\_\_\_\_

Sampling Method:

Bottle

Field staff:

AA/ADP

Data Recorder(s):

AA

**Station Information:**

Sample Location: \_\_\_\_\_

DUP

Date: \_\_\_\_\_

Depth Sampled: \_\_\_\_\_ Time: \_\_\_\_\_

**Station Location and Description:**

GPS (UTM): EASTING: \_\_\_\_\_ NORTHING: \_\_\_\_\_ AVG. ERROR: \_\_\_\_\_ marked

Description: \_\_\_\_\_

Notes: \_\_\_\_\_

**Field Parameters:**

PARAMETER	
pH	
Conductivity	
Temperature	
DO	
ORP	
Turbidity	

COLOUR: \_\_\_\_\_

SHEEN?: \_\_\_\_\_

NOTES: \_\_\_\_\_

Sampling Method: \_\_\_\_\_

Field staff: \_\_\_\_\_

Data Recorder(s): \_\_\_\_\_

**SURFACE WATER FIELD NOTES**

PROJECT #:

**Station Information:**

Sample Location: WL 5509 DUP Date: 20/11/13  
WL-5509 Depth Sampled: 3.0 Time: 1400

**Station Location and Description:**

GPS (UTM): EASTING: NORTHING: AVG. ERROR: marked

Description: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Notes: \_\_\_\_\_

**Field Parameters:**

PARAMETER	
pH	8.90
Conductivity	932.0 $\mu$ S/cm
Temperature	19.60 °C
DO	8.2 mg/L
ORP	111.4 mV
Turbidity <del>TDS</del>	607 mg/L

COLOUR: CLEAR  
 SHEEN?: N  
 NOTES: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Sampling Method: VAN DORN  
 Field staff: CL  
 Data Recorder(s): CL

**Station Information:**

Sample Location: WL5510 DUP Date: 20/11/13  
 Depth Sampled: 3.0 Time: 1430

**Station Location and Description:**

GPS (UTM): EASTING: NORTHING: AVG. ERROR: marked

Description: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Notes: \_\_\_\_\_

**Field Parameters:**

PARAMETER	
pH	8.86
Conductivity	980 $\mu$ S/cm
Temperature	18.80 °C
DO	9.28 mg/L
ORP	<del>221.0</del> 44.4 mV
Turbidity <del>TDS</del>	636 mg/L

COLOUR: CLEAR  
 SHEEN?: N  
 NOTES: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Sampling Method: VAN DORN  
 Field staff: CL  
 Data Recorder(s): CL



**SURFACE WATER FIELD NOTES**

PROJECT #:

**Station Information:**

Sample Location: WL-SS14

DUP

Date: 20/11/13

Depth Sampled: 1.0 Time: 11:45

**Station Location and Description:**

GPS (UTM): EASTING: \_\_\_\_\_ NORTHING: \_\_\_\_\_ AVG. ERROR: \_\_\_\_\_ marked

Description: \_\_\_\_\_

Notes: \_\_\_\_\_

**Field Parameters:**

PARAMETER	
pH	8.58
Conductivity	995 $\mu S/cm$
Temperature	19.9°C
DO	11.79 mg/L
ORP	139.8 mV
Turbidity TDS	6.56 mg/L

COLOUR: CLEAR

SHEEN?: N

NOTES: \_\_\_\_\_

Sampling Method:

VAN DORN

Field staff:

CL

Data Recorder(s):

CL

**Station Information:**

Sample Location: WL-SS15

DUP

Date: 20/11/13

Depth Sampled: 3.0 Time: 12:43

**Station Location and Description:**

GPS (UTM): EASTING: \_\_\_\_\_ NORTHING: \_\_\_\_\_ AVG. ERROR: \_\_\_\_\_ marked

Description: \_\_\_\_\_

Notes: \_\_\_\_\_

**Field Parameters:**

PARAMETER	
pH	8.60
Conductivity	962
Temperature	17.03
DO	8.45
ORP	168.6
Turbidity TDS	6.22

COLOUR: CLEAR

SHEEN?: N

NOTES: \_\_\_\_\_

Sampling Method:

VAN DORN

Field staff:

CL

Data Recorder(s):

CL

depth - 3.0



Annex F

Quality Assurance Quality  
Control

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The objective of this data assessment is to evaluate the quality of data gathered during the project. This process has been undertaken to assess whether the sample data is of a suitable standard to be utilised in this report. The data assessment consists of comparing field and laboratory QA/QC results to documented NEPM, ANZECC, USEPA SW-846 guidelines, USEPA CLP National Functional Guidelines for Inorganic and Organic Data Review, and other internationally recognised publications. The data assessment has been prepared in accordance with the NEPC (2013) *National Environmental Protection (Assessment of Site Contamination) Measure 1999* and NSW EPA (1997) *Guidelines for Consultants Reporting on Contaminated Sites* and NSW DEC (2006) *Guidelines for the NSW Site Auditor Scheme (2<sup>nd</sup> Edition)*. Particular reference is made to the PARCC parameters (precision, accuracy, representativeness, completeness and comparability) in evaluating the data quality.

Table F1 presents the degree of QA/QC pertinent to the field investigations.

Table F2 presents the degree of QA/QC pertinent to the laboratory program.

The data quality indicators of precision, accuracy, representativeness, comparability and completeness have been assessed as shown in Table F3.

Table F1 Field QA/QC Assessment

QA/QC Criterion	Comments
QA/QC program includes replicate samples	Field quality control samples including 25 intra-laboratory duplicates (15 soil, 8 groundwater, 1 surface water and 1 sediment) were analysed to demonstrate the suitability of the validation program. 12 inter-laboratory duplicate samples (7 soil and 5 groundwater) were sent to a secondary laboratory.  The number of samples analysed, including QA/QC replicates, is presented in Table F.4.  Duplicate samples were collected following ERM standard operating procedures, at a ratio slightly below the required ratio of one duplicate for 10 primary samples (1:10); however this is not considered to have material impacts on the investigation.
All relevant media assessed	Soil and groundwater samples were collected from all identified Areas of Environmental Concern (AECs) as part of the characterisation program.
Appropriateness of sampling strategy	Based on the results of the Preliminary ESA and consideration of the intended approach to establishing a baseline of soil and groundwater contamination, the most appropriate sampling design was considered to be a judgemental (targeted) sampling of soil, groundwater, surface water and sediments at the established AECs for the Site. The spatial coverage achieved was considered to be suitable in achieving the project objectives within the constraints of safe and reasonable access. Where investigation locations were not able to be completed due to logistical issues, these were discussed in the report.

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QA/QC Criterion	Comments
Sample collection, handling and transportation procedures.	<p>Samples were collected, handled and transported following ERM standard operating procedures as described in the <i>Project Symphony Sampling and Analysis Quality Plan [Reference 0207423RP01SAQP_DRAFT]</i> (ERM, 2013a).</p>
Sampling is representative of site conditions	<p>Representative samples were collected from all identified AECs including soil, groundwater, surface water and sediment.</p> <ul style="list-style-type: none"> <li>• Field screening - including PID measurements and visual/olfactory observations were noted throughout the drilled profile.</li> <li>• Sample Collection - samples were generally collected at the surface and 0.5 m intervals for the first 2 m and every 1 m thereafter, or where changes in lithological units or significant contamination were noted.</li> <li>• Sample Analysis - generally one shallow sample targeting fill and the zone of surface impacts (0-1.5 m bgl) and one deeper sample targeting natural soil/geology between vadose zone and water bearing unit. Shallow bedrock and refusal on rubble restricted collecting a second sample from the deeper soil profile.</li> <li>• Groundwater - selected soil bores were converted to monitoring wells and groundwater samples were collected. Groundwater monitoring wells were selected to target areas with potential impact or boundary/background areas and to aid in the assessment of groundwater flow directions.</li> </ul>
Field QA/QC plan	<p>The sampling team comprised suitably qualified and experienced ERM environmental scientists.</p> <p>Borehole logs and/or other sampling records were completed, describing the media sampled, the duplicate types and sampling locations.</p> <p>Samples were collected using a combination of hand auger (during NDD), push tube, and where geology necessitated - solid flight auger drilling techniques. Soil samples were placed in laboratory supplied sample jars, stored in an insulated cooler, and forwarded to the NATA accredited laboratory under COC conditions. The methods used to collect the samples, the types of sample containers, preservation techniques and custody protocols were documented appropriately.</p> <p>Inter-laboratory and intra-laboratory analytical results and their relative percentage differences (RPDs) are presented in <i>Table F5 Series</i>. Where samples were collected from push tube cores, samples were not homogenised prior to splitting to minimise loss of volatile analytes. Volatile analytes may have been lost where samples were collected from hand augers and solid flight augers. The RPDs of the duplicate sample pairs were generally below the acceptance limits (30% RPD where one or both values were greater than 10 x LOR or 50% RPD where both values less than 10 x LOR). An evaluation of the analytical data indicated that the data was generally of acceptable precision and accuracy. Minor exceedences of RPD acceptable limits were noted for some primary and duplicate sample pairs, as presented in <i>Table F5 Series</i> and summarised below.</p> <p>Decontamination procedures were implemented between the collection of different groundwater samples. Cross contamination was not considered likely during soil sampling from disposable push tube liners, and decontamination was not undertaken. The processes followed were considered suitable for minimising cross-contamination during sampling. Rinsate blanks were collected to demonstrate the efficacy of the decontamination procedures during groundwater sampling (refer to <i>Table F6</i>).</p>

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QA/QC Criterion	Comments
	<p>Contaminants of concern were below the laboratory limit of reporting in the rinsate samples with the minor exceptions presented in <i>Table F6</i> and summarised below.</p> <p>Trip blank samples were collected as part of this investigation. All COPCs were reported below the laboratory LOR (refer to <i>Table F7 Series</i>).</p> <p>Trip spikes were collected as part of this investigation. Comparison with a trip spike control sample retained by the laboratory did not indicate unacceptable loss of volatile analytes during sample transport with the exception of one batch of soil samples (refer to <i>Table F8 Series</i>). Further discussion on trip spike non-conformances for soil and sediment samples are provided below.</p> <p>Field instruments used as part of this investigation were appropriately calibrated and used according to the manufacturers' instructions. Calibration certificates are provided in <i>Annex E</i>.</p>

### *Field QA/QC Exceedences*

Minor exceedences of field duplicate RPD acceptable limits were noted for primary and duplicate samples, as presented in *Table F5 Series*. Elevated relative percentage differences (RPDs) between soil/sediment duplicate samples were generally attributed to the heterogeneity of the soil matrix. The analytes were well below the adopted guideline value (where available) and therefore these non-conformances were not expected to materially affect the outcomes of this investigation. Elevated RPDs between some groundwater/surface water duplicate sample pairs were generally associated with heavy metals. The range in metal concentrations are considered representative of background levels. These non-conformances were not expected to materially affect the outcomes of this investigation.

Rinsate samples collected during groundwater sampling were taken following decontamination of the interface probe, or from the micropurge pump (when used). Of the 14 rinsate samples collected during the groundwater and surface water sampling program, two rinsate samples were reported to contain minor concentrations of iron, copper and manganese. It is noted that the concentrations of heavy metals detected in the rinsate samples were close to the LOR and did not exceed concentrations measured in groundwater collected from areas considered to represent background concentrations on-site. While the rinsate samples suggest there may have been some minor cross-contamination of low-level heavy metals, this is unlikely to materially affect the outcomes of the investigation.

Eight out of Twelve trip spikes analysed as part of the drilling/soil and sediment sampling program were not within the acceptable recovery limits of 70% to 130% compared to the corresponding trip spike control samples held by the laboratory. One trip spike sample reported ethylbenzene and xylene recoveries exceeding 130%. Soil samples MK\_SB43\_0.2, MK\_SB44\_0.2, MK\_SB62\_0.2, MK\_SB84\_0.2, D01\_061113\_TS and T01\_061113\_TS were transported with this trip spike. Ethylbenzene and xylene concentrations were reported in field samples below the LOR and indicate trip spike results have not affected primary results.

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Seven trip spike samples reported recoveries below 70% compared to the trip spike control samples, suggesting that there was a loss of volatiles during handling and transport. Laboratory supplied trip spikes were typically obtained and held by ERM up to a week prior to use with samples. It is also possible that loss of volatiles occurred during this period and prior to sampling and dispatch to the laboratory.

A review of the borelogs from samples analysed in laboratory batches reporting trip spike recoveries less than acceptable limits typically indicated that PID field screening results were less than 5 ppm v, suggesting that VOCs were not a significant contaminant in these samples. Over the period of investigation, PID screening results exceeded 5ppm at two locations across the site - MD\_MW04 and MK\_SB87. Soils sampled from both locations were submitted with batch ES1323862 (benzene trip spike recovery of 67%). TRH C<sub>6</sub>-C<sub>9</sub> and TRH C<sub>6</sub>-C<sub>10</sub> was detected at both locations and generally correlates with PID results, the concentration of benzene was reported below laboratory LOR. These results should be assessed with consideration for this non-conformance.

Trip spike and trip blank samples were utilised in the majority of batches submitted to the laboratory. Where trip spike and trip blank samples did not accompany samples, the primary samples for analysis of VOCs were generally received in good condition under chain of custody conditions and analysed within the recommended holding times. The temperature of samples on receipt at the laboratory however ranged from 2.5 - 16.8 °C (although it is noted all samples were packed with ice in insulated coolers prior to dispatch via courier from the Site. As noted above, field observations and PID screening results correlate with laboratory results and thus the instances of elevated sample temperatures are considered unlikely to have materially affected results or the interpretation of the dataset.

Table F2 Laboratory QA/QC Assessment

QA/QC Criterion	Comments
Appropriate methodologies used for sample analyses	The primary laboratory used for the investigation was NATA accredited ALS, NATA Registration No. 825. The secondary laboratory used for the investigation was NATA accredited Envirolab, NATA Registration No 2901. All laboratory reports were NATA stamped and signed by a NATA signatory. All analytical methodologies were considered appropriate for the identified contaminants of potential concern in the matrix.
	Statistical data presented in the laboratory QA/QC report was considered adequate in demonstrating the precision and accuracy of the methods used to analyse field samples.
Appropriate practical quantitation limits (LORs)	LORs for each analyte are presented in the laboratory reports. All sample results were reported with LORs below the site assessment criteria with the exception of a small number of volatile organic compounds in groundwater (vinyl chloride, chloromethane, bromomethane, 1,2-Dichloroethane, hexachlorobutadiene, 1,2,3-trichlorobenzene and 1,2-dibromomethane), PAH compounds (Benzo(a) pyrene and Carcinogenic PAHs (as BaP TEQ), mercury and selenium, and PAHs in sediments (Acenaphthene, Acenaphthylene Anthracene, Anthracene, Benzo(a) pyrene, Naphthalene, Chrysene, Dibenz(a,h)anthracene, Fluoranthene, Fluorene, Pyrene, Phenanthrene).

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QA/QC Criterion	Comments
Laboratory QA/QC plan	<p data-bbox="488 230 1356 264">Copies of signed chain of custody forms were returned by the laboratory.</p> <p data-bbox="488 282 1356 667">Samples were received and analysed within specified laboratory holding times with the exception of those soil samples listed in <i>Table F9</i>. This information was documented on the laboratory reports. In most cases the sample was only marginally analysed outside of the recommended laboratory holding time, which is not considered to have material effects on the investigation. Due to a scheduling error, mercury in shallow soils sampled from area MG were extracted 55 days outside of appropriate holding times (28 days). Mercury was detected in only five soil samples collected across the site where concentrations were reported between 0.1-0.2 mg/kg and marginally above the LOR (0.1mg/kg). These results are well below the adopted criteria of 730 mg/kg the noted holding time exceedences are not therefore considered to significantly impact upon the outcome of results.</p> <p data-bbox="488 685 1356 748">The analytical methods used were NATA approved as documented on the laboratory reports.</p> <p data-bbox="488 766 1356 898">Laboratory quality control samples included laboratory control samples, internal duplicates, matrix spikes and method blanks. The types of QA/QC samples analysed by the laboratory for the documented samples were considered sufficient to assess the precision and accuracy of the laboratory methods used.</p> <p data-bbox="488 916 1356 1043">The statistical data presented in the laboratory QA/QC report was considered adequate in demonstrating the precision and accuracy of the methods used to analyse field samples. Minor exceedences of the acceptance criteria were noted, as presented in <i>Table F10 Series</i> to <i>Table F12 Series</i> and <i>Table F13</i>.</p>

*Table F3 Overall Sampling and Analysis Methodology Assessment*

Field Considerations	Laboratory Considerations
<b>Precision Requirements</b>	
The investigation was conducted following ERM SOPs and any variations from these procedures were documented.	<p data-bbox="767 1238 1241 1267">Analysis of the following were reported:</p> <ul data-bbox="767 1272 1241 1402" style="list-style-type: none"> <li data-bbox="767 1272 1241 1335">• laboratory and inter-laboratory duplicates;</li> <li data-bbox="767 1339 1241 1368">• field duplicates; and</li> <li data-bbox="767 1373 1241 1402">• laboratory prepared volatile trip spikes.</li> </ul>



## COMMERCIAL IN CONFIDENCE

Field Considerations	Laboratory Considerations
<b>Precision Comments</b>	
<p>No significant variations from ERM SOPs were noted. Due to the nature of typically gravel and cobble fill overlying bedrock across the site, subsequent drilling techniques (non-destructive drilling, solid flight auger and air hammer) did not allow for soil to be sampled and / or screened with a PID in accordance with ERM's SOP. Elevated PID readings correlate well with analytical results and a lack of field screening using PID is therefore not considered to affect the dataset or sampling program. Field split duplicates were generally reported within the acceptance limits of 30% RPD where one or both values were greater than 10 x LOR or 50% RPD where both values less than 10 x LOR. Minor exceedences were noted, as presented in <i>Table F5 Series</i>. Trip spike recoveries were within the acceptance limits of 70% to 130% RPD. Exceedences were noted, as presented in <i>Table F8 Series</i>. Trip spike recoveries from seven trip spikes were not within acceptable ranges. As discussed previously, these results are generally not considered to affect analytical results. However analytical data for volatile contaminants from laboratory reports ES1323862 must be considered as estimate only. It is noted that PID field screening results from samples collected as part of these laboratory batches, where available, correlated with results of analysis or otherwise suggested that volatiles were not likely to be present. The site activities in the AECs where these samples were collected were considered unlikely to lead to impact from VOCs, with the exception of Workshops (AEC MD), where washing solvents may contribute to VOCs in soil.</p>	
<b>Accuracy Requirements</b>	
<p>The investigation was conducted following ERM SOPs and any variations from these procedures were documented.</p>	<p>Analysis of the following were reported:</p> <ul style="list-style-type: none"><li>• field blanks;</li><li>• rinsate blanks;</li><li>• reagent blanks;</li><li>• method blanks;</li><li>• matrix spikes;</li><li>• surrogate spikes;</li><li>• laboratory control samples; and</li><li>• laboratory prepared spikes.</li></ul>
<b>Accuracy Comments</b>	
<p>No significant variations from ERM SOPs were noted. Laboratory QA/QC samples were reported within the acceptance limits specified in the laboratory reports. Exceptions are presented in <i>Table F10 Series</i> to <i>Table F12 Series</i> and <i>Table F13</i> and the laboratory reports.</p>	
<b>Representativeness Requirements</b>	
<p>Appropriate media were identified and sampled according to the SAQP.</p>	<p>All samples were analysed in general accordance with the SAQP.</p>
<b>Representativeness Comments</b>	

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Field Considerations	Laboratory Considerations
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No exceedences of the requirements were noted.

### Comparability Requirements

The same SOPs were used during each sampling event.

Analytical methods suitable for the target media were used.

All sampling was conducted by an appropriately qualified and experienced sampler.

The LORs used to report analyte concentrations were less than the adopted investigation levels.

The types of samples collected were consistent.

The same laboratories were used to analyse all sample.

Results of Field Screening comparable with Lab analysis.

The same units were used to report analyte concentrations.

Results of Lab analysis comparable with field screening results.

Results of TPH C6-C9 comparable to BTEX etc.

### Comparability Comments

All sample results were reported with LORs below the site assessment criteria with the exception of a small number of VOCs, PAH compounds, mercury and selenium.

### Completeness Requirements

All critical locations were sampled (from grid and at depth).

All critical samples were analysed according to SAQP.

The investigation was conducted following ERM SOPs and variations from these procedures were documented.

All analytes were analysed according to the SAQP.

All sampling was conducted by an appropriately qualified and experienced sampler.

Appropriate analysis methods and LORs were used.

Sample documentation was provided.

Documentation of field works was provided.

Sample holding times were complied with.

### Completeness Comments

Holding time exceptions are presented in *Table F9 Series* and the laboratory reports. Where investigation locations were not able to be completed due to logistical issues, these were discussed in *Table 3.1* in the report. A number of LORs for VOCs in groundwater and PAHs in sediment were below adopted assessment criteria and were discussed in Section 3.5.3 of the report. Given the extent of investigation successfully completed across the site, including targeting of potential sources within AECs, the variations from the SAQP were minor and are generally not considered to affect the outcomes of the investigation.

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Table F4. QA/QC Summary of Samples Analysed  
 Mt Piper Power Station - Stage 2 ESA  
 Project Symphony - 0207423

Matrix Type	Sediment	Soil	Water	Surface Water <sup>1</sup>
First Sample Date	12/12/2013	8/10/2013	3/10/2013	21/11/2013
Last Sample Date	22/11/2013	19/12/2013	19/12/2013	22/11/2013
Sampling Period (days)	3	53	78	2
Number of Samples Submitted	9	282	110	10
Number of Non QA Samples Submitted	8	248	72	7
Number of Field Blanks	0	0	0	0
Number of Trip Blanks	0	12	11	1
Number of Rinsates	0	0	14	0
Number of Field Duplicates	1	15	8	1
Number of Interlab Duplicates	0	7	5	0
Number of Trip Spikes	0	12	11	1
Number of Lab Duplicates	0	339	333	17
Number of LCSs	0	203	268	11
Number of CRMs	0	0	0	0
Number of Method Blanks	0	144	178	9
Number of Storage Blanks	0	0	0	0
Number of Matrix Spikes	0	171	157	9
Number of Matrix Spike Dupes	0	0	0	0

1. Sampled from Lake Lyell and Thompsons Creek Reservoir



SDG	ES1322146	ES1322146	RPD	ES1322434	ES1322434	RPD	ES1322434	Interlab_D	RPD	ES1322146	Interlab_D	RPD	ES1322662	ES1322662	RPD	ES1322662	Interlab_D	RPD
Field_ID	ML_MW08_0.5	D01_091013_TS		MK_SB10_1.2	D_111013_01_GP		MK_SB10_1.2	T_111013_01_GP		D02_091013_TS	T01_091013_TS		MK-SB50-0.1	D-141011-01-GP		MK-SB50-0.1	T_141011_01_GP	
Loc Code	ML_MW08	ML_MW08		MK_SB10	MK_SB10		MK_SB10	MK_SB10		MB_MW03	MB_MW03		MK_SB50	MK_SB50		MK_SB50	MK_SB50	
Sampled Date-Time	9/10/2013 15:00	9/10/2013 15:00		11/10/2013 15:00	11/10/2013 15:00		11/10/2013 15:00	11/10/2013 15:00		9/10/2013 15:00	9/10/2013 15:00		14/10/2013 15:00	14/10/2013 15:00		14/10/2013 15:00	14/10/2013 15:00	

Method_Type	ChemName	Units	EQL																		
PAH/Phenols (SIM)	2,4,5-trichlorophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5	<0.5	0	<0.5					
	2,4,6-trichlorophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5	<0.5	0	<0.5					
	2,4-dichlorophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5	<0.5	0	<0.5					
	2,4-dimethylphenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5	<0.5	0	<0.5					
	2,6-dichlorophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5	<0.5	0	<0.5					
	2-chlorophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5	<0.5	0	<0.5					
	2-methylphenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5	<0.5	0	<0.5					
	2-nitrophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5	<0.5	0	<0.5					
	3-&4-methylphenol	mg/kg	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0			<1.0	<1.0	0	<1.0					
	4-chloro-3-methylphenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5	<0.5	0	<0.5					
	Acenaphthene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.1	0	<0.5	<0.5	0	<0.5	<0.1	0
	Acenaphthylene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.1	0	<0.5	<0.5	0	<0.5	<0.1	0
	Anthracene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.1	0	<0.5	<0.5	0	<0.5	<0.1	0
	Benzo(a)anthracene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.1	0	<0.5	<0.5	0	<0.5	<0.1	0
	Benzo(a) pyrene	mg/kg	0.5 (Primary): 0.05 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.05	0	<0.5	<0.05	0	<0.5	<0.5	0	<0.5	<0.05	0
	Benzo(b)fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5	<0.5	0	<0.5	<0.5	0	<0.5		
	Benzo(g,h,i)perylene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.1	0	<0.5	<0.5	0	<0.5	<0.1	0
	Benzo(k)fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5	<0.5	0	<0.5	<0.5	0	<0.5		
	Carcinogenic PAHs (as B(a)P TEQ (half	mg/kg	0.5	0.6	0.6	0	0.6	0.6	0	0.6				0.6	0.6	0	0.6				
	Carcinogenic PAHs (as B(a)P TEQ (LO	mg/kg	0.5	1.2	1.2	0	1.2	1.2	0	1.2	1.2	82	1.2	1.2	82	1.2	1.2	0	1.2		
Naphthalene	mg/kg	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.1	0	<0.5	<0.5	0	<0.5	<0.1	0	
Chrysene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.1	0	<0.5	<0.5	0	<0.5	<0.1	0	
Dibenz(a,h)anthracene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.1	0	<0.5	<0.5	0	<0.5	<0.1	0	
Fluoranthene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.1	0	<0.5	<0.5	0	<0.5	<0.1	0	
Fluorene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.1	0	<0.5	<0.5	0	<0.5	<0.1	0	
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.1	0	<0.5	<0.5	0	<0.5	<0.1	0	
Phenanthrene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	0.8	46	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	0.2	0	<0.5	<0.5	0	<0.5	<0.1	0	
Pyrene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.1	0	<0.5	<0.5	0	<0.5	<0.1	0	
Pentachlorophenol	mg/kg	2	<2.0	<2.0	0	<2.0	<2.0	0	<2.0			<2.0	<2.0	0	<2.0	<2.0	0	<2.0			
PAHs (Sum of total)	mg/kg	0.5	<0.5	0.8	46	<0.5	<0.5	0	<0.5			<0.5	0.19	0	<0.5	<0.5	0	<0.5			
Phenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5	<0.5	0	<0.5	<0.5	0	<0.5			
Carcinogenic PAHs (as BaP TEQ)	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	
Polychlorinated Biphenyls	PCBs (Sum of total)	mg/kg	0.1																		
Total Mercury by FIMS	Mercury	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	0	
Total Metals by ICP-AES	Arsenic	mg/kg	5 (Primary): 4 (Interlab)	21.0	15.0	33	<5.0	<5.0	0	<5.0	4.0	0	<5.0	<4.0	0	7.0	10.0	35	7.0	8.0	13
	Cadmium	mg/kg	1 (Primary): 0.4 (Interlab)	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<0.4	0	<1.0	<0.4	0	<1.0	1.0	0	<1.0	<0.4	0
	Chromium (III+VI)	mg/kg	2 (Primary): 1 (Interlab)	13.0	18.0	32	4.0	5.0	22	4.0	5.0	22	<2.0	2.0	0	7.0	13.0	60	7.0	11.0	44
	Copper	mg/kg	5 (Primary): 1 (Interlab)	36.0	31.0	15	<5.0	5.0	0	<5.0	6.0	18	<5.0	4.0	0	10.0	10.0	0	10.0	9.0	11
	Lead	mg/kg	5 (Primary): 1 (Interlab)	28.0	36.0	25	9.0	9.0	0	9.0	10.0	11	8.0	8.0	0	20.0	23.0	14	20.0	21.0	5
	Nickel	mg/kg	2 (Primary): 1 (Interlab)	75.0	80.0	6	3.0	6.0	67	3.0	7.0	80	3.0	4.0	29	12.0	15.0	22	12.0	12.0	0
	Selenium	mg/kg	5 (Primary): 2 (Interlab)	<5.0	<5.0	0	<5.0	<5.0	0	<5.0	<2.0	0	<5.0	<2.0	0	<5.0	<5.0	0	<5.0	<2.0	0
	Zinc	mg/kg	5 (Primary): 1 (Interlab)	106.0	108.0	2	6.0	10.0	50	6.0	12.0	67	8.0	9.0	12	33.0	37.0	11	33.0	32.0	3
TPH - Semivolatile Fraction	TRH >C10-C14 Fraction	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0
	TRH >C15-C28 Fraction	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C29-C36 Fraction	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C10-C36 Fraction	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0
	TRH >C10-C16 Fraction	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0
	TRH >C10-C16 less Naphthalene (F2)	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0
	TRH >C16-C34 Fraction	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C34-C40 Fraction	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0
TRH >C10-C40 Fraction	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	<50.0			<50.0	<50.0	0	<50.0	<50.0	0	<50.0			
TPH Volatiles/BTEX	Benzene	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0
	Toluene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Ethylbenzene	mg/kg	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<1.0	0	<0.5	<1.0	0	<0.5	<0.5	0	<0.5	<1.0	0
	Xylene (o)	mg/kg	0.5 (Primary): 1 (Interlab)	<0.5	<0.5																



ES1322662 ML_MW05-0.5 ML_MW05 16/10/2013 15:00	ES1322662 D01-161013-TS ML_MW05 16/10/2013 15:00	RPD	ES1323859 MF_MW04_0.2 MF_MW04 30/10/2013 15:00	ES1323859 D01_301013_TS MF_MW04 30/10/2013 15:00	RPD	ES1323858 ML_MW05_2.9 ML_MW05 31/10/2013 15:00	ES1323858 D01_311013_TS ML_MW05 31/10/2013 15:00	RPD
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Method_Type	ChemName	Units									
PAH/Phenols (SIM)	2,4,5-trichlorophenol	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	2,4,6-trichlorophenol	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	2,4-dichlorophenol	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	2,4-dimethylphenol	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	2,6-dichlorophenol	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	2-chlorophenol	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	2-methylphenol	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	2-nitrophenol	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	3-&4-methylphenol	mg/kg	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	4-chloro-3-methylphenol	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Acenaphthene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Acenaphthylene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Anthracene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo(a)anthracene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo(a) pyrene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo(b)fluoranthene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo(g,h,i)perylene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo(k)fluoranthene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Carcinogenic PAHs (as B(a)P TEQ (half	mg/kg	0.6	0.6	0				0.6	0.6	0
	Carcinogenic PAHs (as B(a)P TEQ (LO	mg/kg	1.2	1.2	0				1.2	1.2	0
	Naphthalene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Chrysene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Dibenz(a,h)anthracene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Fluoranthene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Fluorene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Indeno(1,2,3-c,d)pyrene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Phenanthrene	mg/kg	<0.5	<0.5	0	<0.5	0.5	0	<0.5	<0.5	0
	Pyrene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Pentachlorophenol	mg/kg	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	0
	PAHs (Sum of total)	mg/kg	<0.5	<0.5	0	<0.5	0.5	0	<0.5	<0.5	0
	Phenol	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Carcinogenic PAHs (as BaP TEQ)	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Polychlorinated Biphenyls	PCBs (Sum of total)	mg/kg	<0.1	<0.1	0				<0.1	<0.1	0
Total Mercury by FIMS	Mercury	mg/kg	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0
Total Metals by ICP-AES	Arsenic	mg/kg	10.0	8.0	22	13.0	11.0	17	<5.0	<5.0	0
	Cadmium	mg/kg	1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Chromium (III+VI)	mg/kg	13.0	8.0	48	8.0	11.0	32	7.0	6.0	15
	Copper	mg/kg	11.0	12.0	9	16.0	16.0	0	12.0	13.0	8
	Lead	mg/kg	20.0	16.0	22	20.0	17.0	16	20.0	21.0	5
	Nickel	mg/kg	12.0	12.0	0	60.0	45.0	29	10.0	9.0	11
	Selenium	mg/kg	<5.0	<5.0	0	<5.0	<5.0	0	<5.0	<5.0	0
	Zinc	mg/kg	57.0	37.0	43	76.0	70.0	8	31.0	28.0	10
TPH - Semivolatile Fraction	TRH >C10-C14 Fraction	mg/kg	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0
	TRH >C15-C28 Fraction	mg/kg	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C29-C36 Fraction	mg/kg	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C10-C36 Fraction	mg/kg	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0
	TRH >C10-C16 Fraction	mg/kg	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0
	TRH >C10-C16 less Naphthalene (F2)	mg/kg	<50.0	<50.0	0				<50.0	<50.0	0
	TRH >C16-C34 Fraction	mg/kg	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C34-C40 Fraction	mg/kg	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C10-C40 Fraction	mg/kg	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0
TPH Volatiles/BTEX	Benzene	mg/kg	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0
	Toluene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Ethylbenzene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Xylene (o)	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Xylene (m & p)	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Xylene Total	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Total BTEX	mg/kg	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0
	TRH >C6-C9 Fraction	mg/kg	<10.0	<10.0	0	<10.0	<10.0	0	<10.0	<10.0	0
	TRH >C6-C10 Fraction	mg/kg				<10.0	<10.0	0			
	TRH >C6-C10 Fraction	mg/kg	<10.0	<10.0	0				<10.0	<10.0	0
	TRH >C6-C10 less BTEX (F1)	mg/kg	<10.0	<10.0	0				<10.0	<10.0	0
	TRH >C6-C10 less BTEX (F1)	mg/kg				<10.0	<10.0	0			
	Naphthalene	mg/kg	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
Volatile Organic Compound	1,1,1,2-tetrachloroethane	mg/kg	<0.5	<0.5	0				<0.5	<0.5	0
	1,1,1-trichloroethane	mg/kg	<0.5	<0.5	0				<0.5	<0.5	0
	1,1,2,2-tetrachloroethane	mg/kg	<0.5	<0.5	0				<0.5	<0.5	0
	1,1,2-trichloroethane	mg/kg	<0.5	<0.5	0				<0.5	<0.5	0
	Benzene	mg/kg	<0.2	<0.2	0						
	Toluene	mg/kg	<0.5	<0.5	0						
	Ethylbenzene	mg/kg	<0.5	<0.5	0						
	1,1-dichloroethane	mg/kg	<0.5	<0.5	0				<0.5	<0.5	0
	1,1-dichloroethene	mg/kg	<0.5	<0.5	0				<0.5	<0.5	0
	Xylene (o)	mg/kg	<0.5	<0.5	0						
	1,1-dichloropropene	mg/kg	<0.5	<0.5	0				<0.5	<0.5	0



Xylene (m & p)	mg/kg	<0.5	<0.5	0						
1,2,3-trichlorobenzene	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
1,2,3-trichloropropane	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
1,2,4-trichlorobenzene	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
1,2,4-trimethylbenzene	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
1,2-dibromo-3-chloropropane	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
1,2-dibromoethane	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
1,2-dichlorobenzene	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
1,2-dichloroethane	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
1,2-dichloropropane	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
1,3,5-trimethylbenzene	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
1,3-dichlorobenzene	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
1,3-dichloropropane	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
1,4-dichlorobenzene	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
2,2-dichloropropane	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
2-chlorotoluene	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
Methyl Ethyl Ketone	mg/kg	<5.0	<5.0	0			<5.0	<5.0	0	
2-hexanone (MBK)	mg/kg	<5.0	<5.0	0			<5.0	<5.0	0	
4-chlorotoluene	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
4-Methyl-2-pentanone	mg/kg	<5.0	<5.0	0			<5.0	<5.0	0	
Bromobenzene	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
Bromodichloromethane	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
Bromoform	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
Bromomethane	mg/kg	<5.0	<5.0	0			<5.0	<5.0	0	
Carbon disulfide	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
Carbon tetrachloride	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
Naphthalene	mg/kg	<5.0	<5.0	0			<5.0	<5.0	0	
Chlorobenzene	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
Chlorodibromomethane	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
Chloroethane	mg/kg	<5.0	<5.0	0			<5.0	<5.0	0	
Chloroform	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
Chloromethane	mg/kg	<5.0	<5.0	0			<5.0	<5.0	0	
cis-1,2-dichloroethene	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
cis-1,3-dichloropropene	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
cis-1,4-Dichloro-2-butene	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
Dibromomethane	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
Dichlorodifluoromethane	mg/kg	<5.0	<5.0	0			<5.0	<5.0	0	
Hexachlorobutadiene	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
Iodomethane	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
Isopropylbenzene	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
n-butylbenzene	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
n-propylbenzene	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
Pentachloroethane	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
p-isopropyltoluene	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
sec-butylbenzene	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
Styrene	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
Trichloroethene	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
tert-butylbenzene	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
Tetrachloroethene	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
trans-1,2-dichloroethene	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
trans-1,3-dichloropropene	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
trans-1,4-Dichloro-2-butene	mg/kg	<0.5	<0.5	0			<0.5	<0.5	0	
Trichlorofluoromethane	mg/kg	<5.0	<5.0	0			<5.0	<5.0	0	
Vinyl acetate	mg/kg	<5.0	<5.0	0			<5.0	<5.0	0	
Vinyl chloride	mg/kg	<5.0	<5.0	0			<5.0	<5.0	0	

\*RPDs have only been considered where a concentration is greater than 1 times the detection limit.  
 \*\*High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are:  
 \*\*\*Interlab Duplicates are matched on a per compound basis as methods vary

1. Soil and sediment samples were not homogenised prior to sampling to minimise the risk of cross-contamination. The elevated RPD is likely a result of the heterogeneity of the samples. The concentration is well below the adopted guidelines value (where available) and therefore this non-conformance is unlikely to materially effect the outcomes of this investigation.

2. Soil and sediment samples were not homogenised prior to sampling to minimise the risk of cross-contamination. The elevated RPD is likely a result of the heterogeneity of the samples. The concentration exceeds the acceptable criteria and this non-conformance is unlikely to materially effect the outcomes of this investigation.

3. The concentration is close to the laboratory detection limit and the elevated RPD is likely a result of the heterogeneity of the samples. This RPD non-conformance is unlikely to materially effect the outcomes of this investigation.



Method Type	ChemName	Units	EQL	ES1323862			ES1323862			ES1323862			ES1324470			ES1324470		
				Field_ID	Sampled_Date-Time	RPD	Field_ID	Sampled_Date-Time	RPD	Field_ID	Sampled_Date-Time	RPD	Field_ID	Sampled_Date-Time	RPD	Field_ID	Sampled_Date-Time	RPD
PAH/Phenols (SIM)	2,4,5-trichlorophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	2,4,6-trichlorophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	2,4-dichlorophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	2,4-dimethylphenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	2,6-dichlorophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	2-chlorophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	2-methylphenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	2-nitrophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	3-&4-methylphenol	mg/kg	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	4-chloro-3-methylphenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Acenaphthene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Acenaphthylene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Anthracene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Benz(a)anthracene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo(a) pyrene	mg/kg	0.5 (Primary): 0.05 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo(b)fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo(g,h,i)perylene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo(k)fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Carcinogenic PAHs (as B(a)P TEQ (half LOR))	mg/kg	0.5	0.6	0.6	0	0.6	0.6	0	0.6	0.6	0	0.6	0.6	0	0.6	0.6	0
	Carcinogenic PAHs (as B(a)P TEQ (LOR))	mg/kg	0.5	1.2	1.2	0	1.2	1.2	0	1.2	1.2	0	1.2	1.2	0	1.2	1.2	0
Naphthalene	mg/kg	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	
Chrysene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	
Dibenz(a,h)anthracene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	
Fluoranthene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	
Fluorene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	
Phenanthrene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	
Pyrene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	
Pentachlorophenol	mg/kg	2	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	0	
PAHs (Sum of total)	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	
Phenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	
Carcinogenic PAHs (as BaP TEQ)	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	
Polychlorinated Biphenyls (PCB)	PCBs (Sum of total)	mg/kg	0.1				<0.1	<0.1	0	<0.1	<0.1	0						
Total Mercury by FIMS	Mercury	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0
Total Metals by ICP-AES	Arsenic	mg/kg	5 (Primary): 4 (Interlab)	<5.0	6.0	18	<5.0	<5.0	0	<5.0	<5.0	0	6.0	6.0	0	<5.0	<5.0	0
	Cadmium	mg/kg	1 (Primary): 0.4 (Interlab)	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Chromium (III+VI)	mg/kg	2 (Primary): 1 (Interlab)	17.0	10.0	52	3.0	3.0	0	3.0	3.0	0	7.0	8.0	13	4.0	6.0	40
	Copper	mg/kg	5 (Primary): 1 (Interlab)	16.0	13.0	21	19.0	27.0	35	19.0	16.0	17	12.0	11.0	9	<5.0	8.0	46
	Lead	mg/kg	5 (Primary): 1 (Interlab)	17.0	17.0	0	19.0	17.0	11	19.0	15.0	24	13.0	14.0	7	10.0	11.0	10
	Nickel	mg/kg	2 (Primary): 1 (Interlab)	36.0	14.0	88	3.0	2.0	40	3.0	3.0	0	29.0	26.0	11	<2.0	<2.0	0
	Selenium	mg/kg	5 (Primary): 2 (Interlab)	<5.0	<5.0	0	<5.0	<5.0	0	<5.0	<5.0	0	<5.0	<5.0	0	<5.0	<5.0	0
	Zinc	mg/kg	5 (Primary): 1 (Interlab)	176.0	29.0	143	88.0	69.0	24	88.0	42.0	71	50.0	32.0	44	7.0	8.0	13
TPH - Semivolatile Fraction	TRH >C10-C14 Fraction	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0
	TRH >C15-C28 Fraction	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C29-C36 Fraction	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C10-C36 Fraction	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0
	TRH >C10-C16 Fraction	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0
	TRH >C10-C16 less Naphthalene (F2)	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0
	TRH >C16-C34 Fraction	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C34-C40 Fraction	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0
TRH >C10-C40 Fraction	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	
TPH Volatiles/BTEX	Benzene	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0
	Toluene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Ethylbenzene	mg/kg	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Xylene (o)	mg/kg	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Xylene (m & p)	mg/kg	0.5 (Primary): 2 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Xylene Total	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Total BTEX	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0
	TRH >C6-C9 Fraction	mg/kg	10 (Primary): 25 (Interlab)	<10.0	<10.0	0	<10.0	<10.0	0	<10.0	<10.0	0	<10.0	<10.0	0	<10.0	<10.0	0
	TRH >C6-C10 Fraction	mg/kg	10 (Primary): 25 (Interlab)	<10.0	<10.0	0	<10.0	<10.0	0	<10.0	<10.0	0	<10.0	<10.0	0	<10.0	<10.0	0
	TRH >C6-C10 less BTEX (F1)	mg/kg	10 (Primary): 25 (Interlab)	<10.0	<10.0	0	<10.0	<10.0	0	<10.0	<10.0	0	<10.0	<10.0	0	<10.0	<10.0	0
Naphthalene	mg/kg	1 (Primary): 0.1 (Interlab)	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	
Volatile Organic Compounds	1,1,1,2-tetrachloroethane	mg/kg	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	1,1,1-trichloroethane	mg/kg	0.5 (Primary): 1 (Interlab)	&lt														



Method Type	ChemName	Units	ES1324470			ES1324471			ES1324473			ES1324473			ES1323862			Interlab_D			ES1324470			Interlab_D			ES1324473			Interlab_D					
			MK_SB54_1.0	T_111113_01_GP	RPD	MK_SB49_0.5	D01_071113_TS	RPD	MK_SB05_0.5	T01_281013_01_GP	RPD	MK_SB34_2.0	T_061113_01_GP	RPD	MK_SB49_0.5	T01_071113_TS	RPD	MK_SB05_0.5	T01_281013_01_GP	RPD	MK_SB34_2.0	T_061113_01_GP	RPD	MK_SB49_0.5	T01_071113_TS	RPD	MK_SB05_0.5	T01_281013_01_GP	RPD	MK_SB34_2.0	T_061113_01_GP	RPD			
PAH/Phenols (SIM)	2,4,5-trichlorophenol	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5			<0.5			<0.5			<0.5			<0.5			<0.5			<0.5					
	2,4,6-trichlorophenol	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5			<0.5			<0.5			<0.5			<0.5			<0.5			<0.5					
	2,4-dichlorophenol	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5			<0.5			<0.5			<0.5			<0.5			<0.5			<0.5					
	2,4-dimethylphenol	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5			<0.5			<0.5			<0.5			<0.5			<0.5			<0.5					
	2,6-dichlorophenol	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5			<0.5			<0.5			<0.5			<0.5			<0.5			<0.5					
	2-chlorophenol	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5			<0.5			<0.5			<0.5			<0.5			<0.5			<0.5					
	2-methylphenol	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5			<0.5			<0.5			<0.5			<0.5			<0.5			<0.5					
	2-nitrophenol	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5			<0.5			<0.5			<0.5			<0.5			<0.5			<0.5					
	3-&4-methylphenol	mg/kg	<1.0	<1.0	0	<1.0	<1.0	0	<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0					
	4-chloro-3-methylphenol	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5			<0.5			<0.5			<0.5			<0.5			<0.5			<0.5					
	Acenaphthene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5			
	Acenaphthylene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5			
	Anthracene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5			
	Benz(a)anthracene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5			
	Benzo(a) pyrene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5		<0.05	0	<0.5		<0.05	0	<0.5		<0.05	0	<0.5		<0.05	0	<0.5		<0.05	0	<0.5			
	Benzo(b)fluoranthene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5				<0.5				<0.5				<0.5			<0.5			<0.5					
	Benzo(g,h,i)perylene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5			
	Benzo(k)fluoranthene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5				<0.5				<0.5				<0.5			<0.5			<0.5					
	Carcinogenic PAHs (as B(a)P TEQ (half LOR))	mg/kg	0.6	0.6	0	0.6	0.6	0	0.6			0.6				0.6				0.6				0.6			0.6			0.6					
	Carcinogenic PAHs (as B(a)P TEQ (LOR))	mg/kg	1.2	1.2	0	1.2	1.2	0	1.2			1.2				1.2				1.2				1.2			1.2			1.2					
Naphthalene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5				
Chrysene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5				
Dibenz(a,h)anthracene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5				
Fluoranthene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5		0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5				
Fluorene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5				
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5				
Phenanthrene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5		0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5		0.1	0	<0.5		0.1	0	<0.5				
Pyrene	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5		<0.1	0	<0.5				
Pentachlorophenol	mg/kg	<2.0	<2.0	0	<2.0	<2.0	0	<2.0			<2.0				<2.0				<2.0				<2.0				<2.0			<2.0					
PAHs (Sum of total)	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5		0.24	0	<0.5		<0.5	0	<0.5		<0.5	0	<0.5		0.1	0	<0.5		0.1	0	<0.5				
Phenol	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5				<0.5				<0.5				<0.5				<0.5			<0.5					
Carcinogenic PAHs (as BaP TEQ)	mg/kg	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5		<0.5	0	<0.5		<0.5	0	<0.5		<0.5	0	<0.5		<0.5	0	<0.5		<0.5	0	<0.5				
Polychlorinated Biphenyls (PCB)	PCBs (Sum of total)	mg/kg				<0.1	<0.1	0			<0.1				<0.1				<0.1				<0.1				<0.1			<0.1					
Total Mercury by FIMS	Mercury	mg/kg	<0.1	<0.1	0	<0.1	<0.1	0	<0.1			<0.1		<0.1	0	<0.1		<0.1	0	<0.1		<0.1	0	<0.1		<0.1	0	<0.1		<0.1	0	<0.1			
Total Metals by ICP-AES	Arsenic	mg/kg	<5.0	<5.0	0	10.0	7.0	35	<5.0		6.0	18	6.0	9.0	40	10.0	7.0	35	<5.0		6.0	18	6.0	9.0	40	10.0	7.0	35	<5.0		6.0	18	6.0	9.0	40
	Cadmium	mg/kg	<1.0	<1.0	0	<1.0	<1.0	0	<1.0		<0.4	0	<1.0	<0.4	0	<1.0	<0.4	0	<1.0		<0.4	0	<1.0	<0.4	0	<1.0	<0.4	0	<1.0	<0.4	0	<1.0	<0.4	0	
	Chromium (III+VI)	mg/kg	4.0	5.0	22	10.0	8.0	22	17.0		13.0	27	7.0	11.0	44	10.0	10.0	0	17.0		13.0	27	7.0	11.0	44	10.0	10.0	0	17.0		13.0	27	7.0	11.0	44
	Copper	mg/kg	<5.0	11.0	75	26.0	24.0	8	16.0		15.0	6	12.0	13.0	8	26.0	20.0	26	16.0		15.0	6	12.0	13.0	8	26.0	20.0	26	16.0		15.0	6	12.0	13.0	8
	Lead	mg/kg	10.0	11.0	10	49.0	20.0	84	17.0		19.0	11	13.0	14.0	7	49.0	20.0	84	17.0		19.0	11	13.0	14.0	7	49.0	20.0	84	17.0		19.0	11	13.0	14.0	7
	Nickel	mg/kg	<2.0	<2.0	0	34.0	36.0	6	36.0		14.0	88	29.0	28.0	4	34.0	25.0	31	36.0		14.0	88	29.0	28.0	4	34.0	25.0	31	36.0		14.0	88	29.0	28.0	4
	Selenium	mg/kg	<5.0	<5.0	0	<5.0	<5.0	0	<5.0		<2.0	0	<5.0	<2.0	0	<5.0	<2.0	0	<5.0		<2.0	0	<5.0	<2.0	0	<5.0	<2.0	0	<5.0	<2.0	0	<5.0	<2.0	0	
	Zinc	mg/kg	7.0	23.0	107	145.0	130.0	11	176.0		31.0	140																							



SDG	ES1324233	ES1324233	RPD	ES1324233	ES1324233
Field_ID	MK_SB44_0.2	D01_061113_TS		MK_SB44_0.2	T01_061113_TS
Sampled_Date-Time	6/11/2013 15:00	6/11/2013 15:00		6/11/2013 15:00	6/11/2013 15:00

Method Type	ChemName	Units	EQL						
PAH/Phenols (SIM)	2,4,5-trichlorophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	2,4,6-trichlorophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	2,4-dichlorophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	2,4-dimethylphenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	2,6-dichlorophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	2-chlorophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	2-methylphenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	2-nitrophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	3-&4-methylphenol	mg/kg	1	<1.0	<1.0	0	<1.0	<1.0	0
	4-chloro-3-methylphenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Acenaphthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Acenaphthylene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Benz(a)anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo(a) pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo(b)fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo(g,h,i)perylene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo(k)fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Carcinogenic PAHs (as B(a)P TEQ (half LOR))	mg/kg	0.5	0.6	0.6	0	0.6	0.6	0
	Carcinogenic PAHs (as B(a)P TEQ (LOR))	mg/kg	0.5	1.2	1.2	0	1.2	1.2	0
	Naphthalene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Chrysene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Dibenz(a,h)anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Fluorene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Phenanthrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Pentachlorophenol	mg/kg	2	<2.0	<2.0	0	<2.0	<2.0	0
	PAHs (Sum of total)	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Phenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Carcinogenic PAHs (as BaP TEQ)	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
Total Mercury by FIMS	Mercury	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
Total Metals by ICP-AES	Arsenic	mg/kg	5	8.0	9.0	12	8.0	9.0	12
	Cadmium	mg/kg	1	<1.0	<1.0	0	<1.0	<1.0	0
	Chromium (III+VI)	mg/kg	2	12.0	10.0	18	12.0	9.0	29
	Copper	mg/kg	5	18.0	16.0	12	18.0	16.0	12
	Lead	mg/kg	5	21.0	17.0	21	21.0	18.0	15
	Nickel	mg/kg	2	36.0	36.0	0	36.0	31.0	15
	Selenium	mg/kg	5	<5.0	<5.0	0	<5.0	<5.0	0
	Zinc	mg/kg	5	86.0	70.0	21	86.0	66.0	26
TPH - Semivolatile Fraction	TRH >C10-C14 Fraction	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0
	TRH >C15-C28 Fraction	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C29-C36 Fraction	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C10-C36 Fraction	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0
	TRH >C10-C16 Fraction	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0
	TRH >C10-C16 less Naphthalene (F2)	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0
	TRH >C16-C34 Fraction	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C34-C40 Fraction	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C10-C40 Fraction	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0
TPH Volatiles/BTEX	Benzene	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
	Toluene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Ethylbenzene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Xylene (o)	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Xylene (m & p)	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Xylene Total	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Total BTEX	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0
	TRH >C6-C9 Fraction	mg/kg	10	<10.0	<10.0	0	<10.0	<10.0	0
	TRH >C6-C10 Fraction	mg/kg	10	<10.0	<10.0	0	<10.0	<10.0	0
	TRH >C6-C10 less BTEX (F1)	mg/kg	10	<10.0	<10.0	0	<10.0	<10.0	0
	Naphthalene	mg/kg	1	<1.0	<1.0	0	<1.0	<1.0	0

\*RPDs have only been considered where a concentration is greater than 1 times the EQL.

\*\*High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (1-10 x EQL); 30 (10-20 x EQL); 30 (> 20 x EQL) )

\*\*\*Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

1. Soil and sediment samples were not homogenised prior to sampling to minimise volatilisation of volatile contaminants. The elevated RPD is likely a result of the heterogeneity of the soil matrix. The concentration is well below the adopted guidelines value (where available) and therefore this RPD non-conformance is unlikely to materially effect the outcomes of this investigation.
2. Soil and sediment samples were not homogenised prior to sampling to minimise volatilisation of volatile contaminants. The elevated RPD is likely a result of the heterogeneity of the soil matrix. The RPD marginally exceeds the acceptable criteria and this non-conformance is unlikely to materially effect the outcomes of this investigation.
3. The concentration is close to the laboratory detection limit and the elevated RPD is a result of the small difference between the low concentrations. This RPD non-conformance is unlikely to materially effect the outcomes of this investigation.





SDG	ES1328041	ES1328041		ES1328041	Interlab_D	
Field_ID	MD-MW03	D01_171213_TS	RPD	MD-MW03	T01_171213_TS	RPD
Sampled_Date-Time	17/12/2013 11:55	17/12/2013 11:55		17/12/2013 11:55	17/12/2013 11:55	

Method_Type	ChemName	Units	EQL						
Alkalinity by PC Titrator	Alkalinity (Bicarbonate as CaCO3)	mg/l	1	72.0	73.0	1	72.0		
	Alkalinity (Carbonate as CaCO3)	mg/l	1	<1.0	<1.0	0	<1.0		
	Alkalinity (Hydroxide) as CaCO3	µg/l	1000	<1000.0	<1000.0	0	<1000.0		
	Alkalinity (total) as CaCO3	mg/l	1	72.0	73.0	1	72.0		
Chloride by Discrete Analyser	Chloride	mg/l	1	145.0	146.0	1	145.0	140.0	4
Dissolved Mercury by FIMS	Mercury	µg/l	0.1 (Primary): 0.05 (Interlab)	<0.1	<0.1	0	<0.1	<0.05	0
Dissolved Metals in Fresh Water -Suite A by OR	Arsenic	µg/L	0.2 (Primary): 1 (Interlab)	5.9	5.7	3	5.9	4.0	38
	Boron	µg/L	5	17.0	17.0	0	17.0		
	Cadmium	µg/L	0.05 (Primary): 0.1 (Interlab)	0.13	0.13	0	0.13	0.1	26
	Chromium (III+VI)	µg/L	0.2 (Primary): 1 (Interlab)	2.9	2.9	0	2.9	3.0	3
	Copper	µg/L	0.5 (Primary): 1 (Interlab)	1.0	1.0	0	1.0	1.0	0
	Lead	µg/L	0.1 (Primary): 1 (Interlab)	16.4	17.2	5	16.4	19.0	15
	Manganese	µg/L	0.5	616.0	598.0	3	616.0		
	Nickel	µg/L	0.5 (Primary): 1 (Interlab)	40.6	40.6	0	40.6	35.0	15
Zinc	µg/L	1	104.0	105.0	1	104.0	76.0	31	
Dissolved Metals in Fresh Water -Suite B by OR	Selenium	µg/L	0.2	1.1	1.1	0	1.1		
Fluoride by PC Titrator	Fluoride	mg/l	0.1	0.1	0.1	0	0.1		
Ionic Balance by PCT DA and Turbi SO4 DA	Anions Total	meq/L	0.01	9.53	9.53	0	9.53		
	Cations Total	meq/L	0.01	9.17	9.17	0	9.17		
	Ionic Balance	%	0.01	1.91	1.94	2	1.91	2.4	23
Major Cations - Dissolved	Calcium	µg/l	1000 (Primary): 500 (Interlab)	19000.0	19000.0	0	19000.0	19000.0	0
	Magnesium	µg/l	1000 (Primary): 500 (Interlab)	6000.0	6000.0	0	6000.0	6700.0	11
	Potassium (Filtered)	µg/l	1000 (Primary): 500 (Interlab)	3000.0	3000.0	0	3000.0	4500.0	40
	Sodium (Filtered)	mg/l	1 (Primary): 0.5 (Interlab)	176.0	176.0	0	176.0	190.0	8
PAH/Phenols (GC/MS - SIM)	2,4,5-trichlorophenol	µg/L	1	<1.0	<1.0	0	<1.0		
	2,4,6-trichlorophenol	µg/L	1	<1.0	<1.0	0	<1.0		
	2,4-dichlorophenol	µg/L	1	<1.0	<1.0	0	<1.0		
	2,4-dimethylphenol	µg/L	1	<1.0	<1.0	0	<1.0		
	2,6-dichlorophenol	µg/L	1	<1.0	<1.0	0	<1.0		
	2-chlorophenol	µg/L	1	<1.0	<1.0	0	<1.0		
	2-methylphenol	µg/L	1	<1.0	<1.0	0	<1.0		
	2-nitrophenol	µg/L	1	<1.0	<1.0	0	<1.0		
	3-&4-methylphenol	µg/L	2	<2.0	<2.0	0	<2.0		
	4-chloro-3-methylphenol	µg/L	1	<1.0	<1.0	0	<1.0		
	Acenaphthene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	Acenaphthylene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	Anthracene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	Benz(a)anthracene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	Benzo(a) pyrene	µg/L	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	0	<0.5	<1.0	0
	Benzo(b)fluoranthene	µg/L	1	<1.0	<1.0	0	<1.0		
	Benzo(g,h,i)perylene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	Benzo(k)fluoranthene	µg/L	1	<1.0	<1.0	0	<1.0		
	Naphthalene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	Chrysene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	Dibenz(a,h)anthracene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	Fluoranthene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	Fluorene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
Indeno(1,2,3-c,d)pyrene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	
Phenanthrene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	



	Pyrene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	Pentachlorophenol	µg/L	2	<2.0	<2.0	0	<2.0		
	PAHs (Sum of total)	µg/L	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	0	<0.5	<1.0	0
	Phenol	µg/L	1	<1.0	<1.0	0	<1.0		
	Carcinogenic PAHs (as BaP TEQ)	µg/L	0.5 (Primary): 5 (Interlab)	<0.5	<0.5	0	<0.5	<5.0	0
Sulfate (Turbidimetric) as SO4 2- by Discrete An	Sulphate (Filtered)	mg/l	1	192.0	190.0	1	192.0		
TPH - Semivolatile Fraction	TRH >C10-C14 Fraction	µg/L	50	<50.0	<50.0	0	<50.0	<50.0	0
	TRH >C15-C28 Fraction	µg/L	100	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C29-C36 Fraction	µg/L	50 (Primary): 100 (Interlab)	<50.0	<50.0	0	<50.0	<100.0	0
	TRH >C10-C36 Fraction	µg/L	50	<50.0	<50.0	0	<50.0		
	TRH >C10-C16 Fraction	µg/L	100 (Primary): 50 (Interlab)	<100.0	<100.0	0	<100.0	<50.0	0
	TRH >C10-C16 less Naphthalene (F2)	µg/L	100 (Primary): 50 (Interlab)	<100.0	<100.0	0	<100.0	<50.0	0
	TRH >C16-C34 Fraction	µg/L	100	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C34-C40 Fraction	µg/L	100	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C10-C40 Fraction	µg/L	100	<100.0	<100.0	0	<100.0		
TPH Volatiles/BTEX	Benzene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	Toluene	µg/L	2 (Primary): 1 (Interlab)	<2.0	<2.0	0	<2.0	<1.0	0
	Ethylbenzene	µg/L	2 (Primary): 1 (Interlab)	<2.0	<2.0	0	<2.0	<1.0	0
	Xylene (o)	µg/L	2 (Primary): 1 (Interlab)	<2.0	<2.0	0	<2.0	<1.0	0
	Xylene (m & p)	µg/L	2	<2.0	<2.0	0	<2.0	<2.0	0
	Xylene Total	µg/L	2	<2.0	<2.0	0	<2.0		
	Total BTEX	µg/L	1	<1.0	<1.0	0	<1.0		
	TRH >C6-C9 Fraction	µg/L	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<10.0	0
	TRH >C6-C10 Fraction	µg/L	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<10.0	0
	TRH >C6-C10 less BTEX (F1)	µg/L	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<10.0	0
	Naphthalene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
Volatile Organic Compounds	1,1,1,2-tetrachloroethane	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
	1,1,1-trichloroethane	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
	1,1,2,2-tetrachloroethane	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
	1,1,2-trichloroethane	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
	1,1-dichloroethane	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
	1,1-dichloroethene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
	1,1-dichloropropene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
	1,2,3-trichlorobenzene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
	1,2,3-trichloropropane	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
	1,2,4-trichlorobenzene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
	1,2,4-trimethylbenzene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
	1,2-dibromo-3-chloropropane	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
	1,2-dibromoethane	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
	1,2-dichlorobenzene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
	1,2-dichloroethane	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
	1,2-dichloropropane	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
	1,3,5-trimethylbenzene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
	1,3-dichlorobenzene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
	1,3-dichloropropane	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
	1,4-dichlorobenzene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
	2,2-dichloropropane	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
	2-chlorotoluene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
	Methyl Ethyl Ketone	µg/L	50	<50.0	<50.0	0	<50.0		
	2-hexanone (MBK)	µg/L	50	<50.0	<50.0	0	<50.0		
	4-chlorotoluene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
	4-Methyl-2-pentanone	µg/L	50	<50.0	<50.0	0	<50.0		
	Bromobenzene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
	Bromodichloromethane	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
	Bromoform	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
	Bromomethane	µg/L	50 (Primary): 10 (Interlab)	<50.0	<50.0	0	<50.0	<10.0	0
	Carbon disulfide	µg/L	5	<5.0	<5.0	0	<5.0		
	Carbon tetrachloride	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
	Naphthalene	µg/L	7 (Primary): 1 (Interlab)	<7.0	<7.0	0	<7.0	<1.0	0

Chlorobenzene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
Chlorodibromomethane	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
Chloroethane	µg/L	50 (Primary): 10 (Interlab)	<50.0	<50.0	0	<50.0	<10.0	0
Chloroform	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
Chloromethane	µg/L	50 (Primary): 10 (Interlab)	<50.0	<50.0	0	<50.0	<10.0	0
cis-1,2-dichloroethene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
cis-1,3-dichloropropene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
cis-1,4-Dichloro-2-butene	µg/L	5	<5.0	<5.0	0	<5.0		
Dibromomethane	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
Dichlorodifluoromethane	µg/L	50 (Primary): 10 (Interlab)	<50.0	<50.0	0	<50.0	<10.0	0
Hexachlorobutadiene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
Iodomethane	µg/L	5	<5.0	<5.0	0	<5.0		
Isopropylbenzene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
n-butylbenzene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
n-propylbenzene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
Pentachloroethane	µg/L	5	<5.0	<5.0	0	<5.0		
p-isopropyltoluene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
sec-butylbenzene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
Styrene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
Trichloroethene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
tert-butylbenzene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
Tetrachloroethene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
trans-1,2-dichloroethene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
trans-1,3-dichloropropene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0
trans-1,4-Dichloro-2-butene	µg/L	5	<5.0	<5.0	0	<5.0		
Trichlorofluoromethane	µg/L	50 (Primary): 10 (Interlab)	<50.0	<50.0	0	<50.0	<10.0	0
Vinyl acetate	µg/L	50	<50.0	<50.0	0	<50.0		
Vinyl chloride	µg/L	50 (Primary): 10 (Interlab)	<50.0	<50.0	0	<50.0	<10.0	0

\*RPDs have only been considered where a concentration is greater than 1 times the EQL.

\*\*High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (1-10 x EQL); 30 (10-20 x EQL); 30 (> 20 x EQL) )

\*\*\*Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

1. RPD exceeds the acceptable limit however concentration is well below the adopted guideline value therefore this non-conformance is unlikely to materially effect the outcomes of this investigation.
2. The RPD marginally exceeds the acceptable criteria and this non-conformance is unlikely to materially effect the outcomes of this investigation.
3. The concentration is close to the laboratory detection limit and the elevated RPD is a result of the small different between the low concentrations. This RPD non-conformance is unlikely to materially effect the outcomes of this investigation.
4. The RPD exceeds the acceptable limits. The higher value was reported for conservatism.
5. The RPD exceeds the acceptable criteria. Metal concentrations are considered within the range of background concentrations and this non-conformance is unlikely to materially effect the outcomes of this investigation.



<b>SDG</b>	ES1323856	ES1323856	
<b>Field_ID</b>	MG_X_4/D1	D02_GW5_041113	<b>RPD</b>
<b>Sampled_Date-Time</b>	4/11/2013 11:00	4/11/2013 11:00	

Method_Type	ChemName	Units	EQL			
Alkalinity by PC Titrator	Alkalinity (Bicarbonate as CaCO3)	mg/l	1	134.0	135.0	1
	Alkalinity (Carbonate as CaCO3)	mg/l	1	<1.0	<1.0	0
	Alkalinity (Hydroxide) as CaCO3	µg/l	1000	<1000.0	<1000.0	0
	Alkalinity (total) as CaCO3	mg/l	1	134.0	135.0	1
Chloride by Discrete Analyser	Chloride	mg/l	1	147.0	151.0	3
Dissolved Mercury by FIMS	Mercury	µg/l	0.1	<0.1	<0.1	0
Dissolved Metals by ICP-MS - Suite A	Arsenic	µg/l	1	8.0	11.0	32
	Boron	µg/l	50	2180.0	1910.0	13
	Cadmium	µg/l	0.1	<0.1	<0.1	0
	Chromium (III+VI)	µg/l	1	<1.0	<1.0	0
	Copper	µg/l	1	<1.0	1.0	0
	Iron	µg/l	50	37500.0	34600.0	8
	Lead	µg/l	1	<1.0	<1.0	0
	Manganese	µg/l	1	11000.0	9780.0	12
	Nickel	µg/l	1	660.0	623.0	6
	Selenium	µg/l	10	<10.0	<10.0	0
Zinc	µg/l	5	50.0	52.0	4	
Fluoride by PC Titrator	Fluoride	mg/l	0.1	<0.1	<0.1	0
Ionic Balance by PCT DA and Turbi SO4 DA	Anions Total	meq/L	0.01	37.6	38.0	1
	Cations Total	meq/L	0.01	36.7	37.0	1
	Ionic Balance	%	0.01	1.31	1.28	2
Major Cations - Dissolved	Calcium	µg/l	1000	273000.0	275000.0	1
	Magnesium	µg/l	1000	190000.0	192000.0	1
	Potassium (Filtered)	µg/l	1000	24000.0	24000.0	0
	Sodium (Filtered)	mg/l	1	156.0	158.0	1
PAH/Phenols (GC/MS - SIM)	2,4,5-trichlorophenol	µg/L	1	<1.0	<1.0	0
	2,4,6-trichlorophenol	µg/L	1	<1.0	<1.0	0
	2,4-dichlorophenol	µg/L	1	<1.0	<1.0	0
	2,4-dimethylphenol	µg/L	1	<1.0	<1.0	0
	2,6-dichlorophenol	µg/L	1	<1.0	<1.0	0
	2-chlorophenol	µg/L	1	<1.0	<1.0	0
	2-methylphenol	µg/L	1	<1.0	<1.0	0
	2-nitrophenol	µg/L	1	<1.0	<1.0	0
	3-&4-methylphenol	µg/L	2	<2.0	<2.0	0
	4-chloro-3-methylphenol	µg/L	1	<1.0	<1.0	0
	Acenaphthene	µg/L	1	<1.0	<1.0	0
	Acenaphthylene	µg/L	1	<1.0	<1.0	0
	Anthracene	µg/L	1	<1.0	<1.0	0
	Benz(a)anthracene	µg/L	1	<1.0	<1.0	0
	Benzo(a) pyrene	µg/L	0.5	<0.5	<0.5	0
	Benzo(b)fluoranthene	µg/L	1	<1.0	<1.0	0
	Benzo(g,h,i)perylene	µg/L	1	<1.0	<1.0	0
	Benzo(k)fluoranthene	µg/L	1	<1.0	<1.0	0
	Naphthalene	µg/L	1	<1.0	<1.0	0
	Chrysene	µg/L	1	<1.0	<1.0	0
Dibenz(a,h)anthracene	µg/L	1	<1.0	<1.0	0	



	Fluoranthene	µg/L	1	<1.0	<1.0	0
	Fluorene	µg/L	1	<1.0	<1.0	0
	Indeno(1,2,3-c,d)pyrene	µg/L	1	<1.0	<1.0	0
	Phenanthrene	µg/L	1	<1.0	<1.0	0
	Pyrene	µg/L	1	<1.0	<1.0	0
	Pentachlorophenol	µg/L	2	<2.0	<2.0	0
	PAHs (Sum of total)	µg/L	0.5	<0.5	<0.5	0
	Phenol	µg/L	1	<1.0	<1.0	0
	Carcinogenic PAHs (as BaP TEQ)	µg/L	0.5	<0.5	<0.5	0
Sulfate (Turbidimetric) as SO4 2- by Discrete An	Sulphate (Filtered)	mg/l	1	1480.0	1490.0	1
TPH - Semivolatile Fraction	TRH >C10-C14 Fraction	µg/L	50	<50.0	<50.0	0
	TRH >C15-C28 Fraction	µg/L	100	<100.0	<100.0	0
	TRH >C29-C36 Fraction	µg/L	50	<50.0	<50.0	0
	TRH >C10-C36 Fraction	µg/L	50	<50.0	<50.0	0
	TRH >C10-C16 Fraction	µg/L	100	<100.0	<100.0	0
	TRH >C10-C16 less Naphthalene (F2)	µg/L	100	<100.0	<100.0	0
	TRH >C16-C34 Fraction	µg/L	100	<100.0	<100.0	0
	TRH >C34-C40 Fraction	µg/L	100	<100.0	<100.0	0
	TRH >C10-C40 Fraction	µg/L	100	<100.0	<100.0	0
TPH Volatiles/BTEX	Benzene	µg/L	1	<1.0	<1.0	0
	Toluene	µg/L	2	<2.0	<2.0	0
	Ethylbenzene	µg/L	2	<2.0	<2.0	0
	Xylene (o)	µg/L	2	<2.0	<2.0	0
	Xylene (m & p)	µg/L	2	<2.0	<2.0	0
	Xylene Total	µg/L	2	<2.0	<2.0	0
	Total BTEX	µg/L	1	<1.0	<1.0	0
	TRH >C6-C9 Fraction	µg/L	20	<20.0	<20.0	0
	TRH >C6-C10 Fraction	µg/L	20	<20.0	<20.0	0
	TRH >C6-C10 less BTEX (F1)	µg/L	20	<20.0	<20.0	0
	Naphthalene	µg/L	5	<5.0	<5.0	0

\*RPDs have only been considered where a concentration is greater than 1 times the EQL.

\*\*High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (1-10 x EQL); 30 (10-20 x EQL); 30 (> 20 x EQL) )

\*\*\*Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

1. RPD exceeds the acceptable limit however concentration is well below the adopted guideline value therefore this non-conformance is unlikely to materially effect the outcomes of this investigation.
2. The RPD marginally exceeds the acceptable criteria and this non-conformance is unlikely to materially effect the outcomes of this investigation.
3. The concentration is close to the laboratory detection limit and the elevated RPD is a result of the small different between
4. The RPD exceeds the acceptable limits. The higher value was reported for conservatism.
5. The RPD exceeds the acceptable criteria. Metal concentrations are considered within the range of background concentrations and this non-conformance is unlikely to materially effect the outcomes of this investigation.

Method_Type	ChemName	Units	EQL	ES1327569			ES1327570			ES1327570		
				Field_ID	Sampled_Date-Time	RPD	Field_ID	Sampled_Date-Time	RPD	Field_ID	Sampled_Date-Time	RPD
Alkalinity by PC Titrator	Alkalinity (Bicarbonate as CaCO3)	mg/l	1				44.0	49.0	11	44.0		
	Alkalinity (Carbonate as CaCO3)	mg/l	1				<1.0	<1.0	0	<1.0		
	Alkalinity (Hydroxide) as CaCO3	µg/l	1000				<1000.0	<1000.0	0	<1000.0		
	Alkalinity (total) as CaCO3	mg/l	1				44.0	49.0	11	44.0		
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyse	Sulphate (Filtered)	mg/l	1				175.0	176.0	1	175.0		
	Sulphate as S (Filtered)	mg/l	1	18.0	19.0	5						
Chloride by Discrete Analyser	Chloride	mg/l	1	14.0	10.0	33	11.0	10.0	10	11.0	12.0	9
Ferrous Iron by Discrete Analyser	Ferrous Iron	µg/l	50	2500.0	2530.0	1	2340.0			2340.0	2000.0	16
Fluoride by PC Titrator	Fluoride	mg/l	0.1	<0.1			<0.1	<0.1	0	<0.1	<0.1	0
Ionic Balance by PCT DA and Turbi SO4 DA	Anions Total	meq/L	0.01				4.83	4.93	2	4.83		
	Cations Total	meq/L	0.01				4.72	4.74	0	4.72		
	Ionic Balance	%	0.01				1.17	1.89	47	1.17	-8.3	200
Major Cations - Dissolved	Calcium	µg/l	1000 (Primary): 500 (Interlab)	22000.0	22000.0	0	25000.0	25000.0	0	25000.0	26000.0	4
	Magnesium	µg/l	1000 (Primary): 500 (Interlab)	11000.0	11000.0	0	27000.0	26000.0	4	27000.0	26000.0	4
	Potassium (Filtered)	µg/l	1000 (Primary): 500 (Interlab)	10000.0	9000.0	11	10000.0	10000.0	0	10000.0	7600.0	27
	Sodium (Filtered)	mg/l	1 (Primary): 0.5 (Interlab)	14.0	13.0	7	21.0	21.0	0	21.0	16.0	27
Dissolved Mercury by FIMS	Mercury	µg/l	0.1 (Primary): 0.05 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.05	0
Dissolved Metals by ICP-MS - Suite A	Arsenic	µg/l	1				<1.0	<1.0	0	<1.0	<1.0	0
	Boron	µg/l	50 (Primary): 5 (Interlab)				<50.0	<50.0	0	<50.0	30.0	0
	Cadmium	µg/l	0.1				<0.1	<0.1	0	<0.1	<0.1	0
	Chromium (III+VI)	µg/l	1				<1.0	<1.0	0	<1.0	<1.0	0
	Copper	µg/l	1				<1.0	<1.0	0	<1.0	<1.0	0
	Lead	µg/l	1				<1.0	<1.0	0	<1.0	<1.0	0
	Manganese	µg/l	1 (Primary): 5 (Interlab)				1800.0	1840.0	2	1800.0	1700.0	6
	Nickel	µg/l	1				56.0	58.0	4	56.0	55.0	2
	Selenium	µg/l	10 (Primary): 1 (Interlab)				<10.0	<10.0	0	<10.0	<1.0	0
	Zinc	µg/l	5 (Primary): 1 (Interlab)				89.0	86.0	3	89.0	71.0	23
	Dissolved Metals in Fresh Water -Suite A by ORC-I	Arsenic	µg/L	0.2 (Primary): 1 (Interlab)	0.7	0.7	0					
Boron		µg/L	5	39.0	33.0	17						
Cadmium		µg/L	0.05 (Primary): 0.1 (Interlab)	<0.05	<0.05	0						
Chromium (III+VI)		µg/L	0.2 (Primary): 1 (Interlab)	<0.2	0.3	40						
Copper		µg/L	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	0						
Lead		µg/L	0.1 (Primary): 1 (Interlab)	0.1	0.2	67						
Manganese		µg/L	0.5 (Primary): 5 (Interlab)	354.0	321.0	10						
Nickel		µg/L	0.5 (Primary): 1 (Interlab)	31.4	32.2	3						
Zinc		µg/L	1	57.0	58.0	2						
Dissolved Metals in Fresh Water -Suite B by ORC-I	Selenium	µg/L	0.2 (Primary): 1 (Interlab)	<0.2	<0.2	0						
PAH/Phenols (GC/MS - SIM)	2,4,5-trichlorophenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0		
	2,4,6-trichlorophenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0		
	2,4-dichlorophenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0		
	2,4-dimethylphenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0		
	2,6-dichlorophenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0		
	2-chlorophenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0		
	2-methylphenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0		
	2-nitrophenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0		
	3-&4-methylphenol	µg/L	2	<2.0	<2.0	0	<2.0	<2.0	0	<2.0		
	4-chloro-3-methylphenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0		
	Acenaphthene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Acenaphthylene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Anthracene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Benz(a)anthracene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Benzo(a) pyrene	µg/L	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<1.0	0
	Benzo(b)fluoranthene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Benzo(g,h,i)perylene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Benzo(k)fluoranthene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Naphthalene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Chrysene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0



	Dibenz(a,h)anthracene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Fluoranthene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Fluorene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Indeno(1,2,3-c,d)pyrene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Phenanthrene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Pyrene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Pentachlorophenol	µg/L	2	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	0
	PAHs (Sum of total)	µg/L	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<1.0	0
	Phenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Carcinogenic PAHs (as BaP TEQ)	µg/L	0.5 (Primary): 5 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<5.0	0
Polychlorinated Biphenyls (PCB)	PCBs (Sum of total)	µg/L	1				<1.0	<1.0	0	<1.0	<1.0	0
TPH - Semivolatile Fraction	TRH >C10-C14 Fraction	µg/L	50	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0
	TRH >C15-C28 Fraction	µg/L	100	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C29-C36 Fraction	µg/L	50 (Primary): 100 (Interlab)	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<100.0	0
	TRH >C10-C36 Fraction	µg/L	50	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0
	TRH >C10-C16 Fraction	µg/L	100 (Primary): 50 (Interlab)	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<50.0	0
	TRH >C10-C16 less Naphthalene (F2)	µg/L	100 (Primary): 50 (Interlab)	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<50.0	0
	TRH >C16-C34 Fraction	µg/L	100	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C34-C40 Fraction	µg/L	100	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C10-C40 Fraction	µg/L	100	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0
TPH Volatiles/BTEX	Benzene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Toluene	µg/L	2 (Primary): 1 (Interlab)	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<1.0	0
	Ethylbenzene	µg/L	2 (Primary): 1 (Interlab)	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<1.0	0
	Xylene (o)	µg/L	2 (Primary): 1 (Interlab)	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<1.0	0
	Xylene (m & p)	µg/L	2	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	0
	Xylene Total	µg/L	2	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	0
	Total BTEX	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	TRH >C6-C9 Fraction	µg/L	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<20.0	0	<20.0	<10.0	0
	TRH >C6-C10 Fraction	µg/L	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<20.0	0	<20.0	<10.0	0
	TRH >C6-C10 less BTEX (F1)	µg/L	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<20.0	0	<20.0	<10.0	0
	Naphthalene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<5.0	0	<5.0	<1.0	0
Volatile Organic Compounds	1,1,1,2-tetrachloroethane	µg/L	5 (Primary): 1 (Interlab)				<5.0	<5.0	0	<5.0	<1.0	0
	1,1,1-trichloroethane	µg/L	5 (Primary): 1 (Interlab)				<5.0	<5.0	0	<5.0	<1.0	0
	1,1,2,2-tetrachloroethane	µg/L	5 (Primary): 1 (Interlab)				<5.0	<5.0	0	<5.0	<1.0	0
	1,1,2-trichloroethane	µg/L	5 (Primary): 1 (Interlab)				<5.0	<5.0	0	<5.0	<1.0	0
	1,1-dichloroethane	µg/L	5 (Primary): 1 (Interlab)				<5.0	<5.0	0	<5.0	<1.0	0
	1,1-dichloroethene	µg/L	5 (Primary): 1 (Interlab)				<5.0	<5.0	0	<5.0	<1.0	0
	1,1-dichloropropene	µg/L	5 (Primary): 1 (Interlab)				<5.0	<5.0	0	<5.0	<1.0	0
	1,2,3-trichlorobenzene	µg/L	5 (Primary): 1 (Interlab)				<5.0	<5.0	0	<5.0	<1.0	0
	1,2,3-trichloropropane	µg/L	5 (Primary): 1 (Interlab)				<5.0	<5.0	0	<5.0	<1.0	0
	1,2,4-trichlorobenzene	µg/L	5 (Primary): 1 (Interlab)				<5.0	<5.0	0	<5.0	<1.0	0
	1,2,4-trimethylbenzene	µg/L	5 (Primary): 1 (Interlab)				<5.0	<5.0	0	<5.0	<1.0	0
	1,2-dibromo-3-chloropropane	µg/L	5 (Primary): 1 (Interlab)				<5.0	<5.0	0	<5.0	<1.0	0
	1,2-dibromoethane	µg/L	5 (Primary): 1 (Interlab)				<5.0	<5.0	0	<5.0	<1.0	0
	1,2-dichlorobenzene	µg/L	5 (Primary): 1 (Interlab)				<5.0	<5.0	0	<5.0	<1.0	0
	1,2-dichloroethane	µg/L	5 (Primary): 1 (Interlab)				<5.0	<5.0	0	<5.0	<1.0	0
	1,2-dichloropropane	µg/L	5 (Primary): 1 (Interlab)				<5.0	<5.0	0	<5.0	<1.0	0
	1,3,5-trimethylbenzene	µg/L	5 (Primary): 1 (Interlab)				<5.0	<5.0	0	<5.0	<1.0	0
	1,3-dichlorobenzene	µg/L	5 (Primary): 1 (Interlab)				<5.0	<5.0	0	<5.0	<1.0	0
	1,3-dichloropropane	µg/L	5 (Primary): 1 (Interlab)				<5.0	<5.0	0	<5.0	<1.0	0
	1,4-dichlorobenzene	µg/L	5 (Primary): 1 (Interlab)				<5.0	<5.0	0	<5.0	<1.0	0
	2,2-dichloropropane	µg/L	5 (Primary): 1 (Interlab)				<5.0	<5.0	0	<5.0	<1.0	0
	2-chlorotoluene	µg/L	5 (Primary): 1 (Interlab)				<5.0	<5.0	0	<5.0	<1.0	0
	Methyl Ethyl Ketone	µg/L	50				<50.0	<50.0	0	<50.0	<50.0	0
	2-hexanone (MBK)	µg/L	50				<50.0	<50.0	0	<50.0	<50.0	0
	4-chlorotoluene	µg/L	5 (Primary): 1 (Interlab)				<5.0	<5.0	0	<5.0	<1.0	0
	4-Methyl-2-pentanone	µg/L	50				<50.0	<50.0	0	<50.0	<50.0	0
	Bromobenzene	µg/L	5 (Primary): 1 (Interlab)				<5.0	<5.0	0	<5.0	<1.0	0
	Bromodichloromethane	µg/L	5 (Primary): 1 (Interlab)				<5.0	<5.0	0	<5.0	<1.0	0
	Bromoform	µg/L	5 (Primary): 1 (Interlab)				<5.0	<5.0	0	<5.0	<1.0	0
	Bromomethane	µg/L	50 (Primary): 10 (Interlab)				<50.0	<50.0	0	<50.0	<10.0	0
	Carbon disulfide	µg/L	5				<5.0	<5.0	0	<5.0	<5.0	0
	Carbon tetrachloride	µg/L	5 (Primary): 1 (Interlab)				<5.0	<5.0	0	<5.0	<1.0	0
	Naphthalene	µg/L	7 (Primary): 1 (Interlab)				<7.0	<7.0	0	<7.0	<1.0	0

Chlorobenzene	µg/L	5 (Primary): 1 (Interlab)							<5.0	<5.0	0	<5.0	<1.0	0
Chlorodibromomethane	µg/L	5 (Primary): 1 (Interlab)							<5.0	<5.0	0	<5.0	<1.0	0
Chloroethane	µg/L	50 (Primary): 10 (Interlab)							<50.0	<50.0	0	<50.0	<10.0	0
Chloroform	µg/L	5 (Primary): 1 (Interlab)							<5.0	<5.0	0	<5.0	<1.0	0
Chloromethane	µg/L	50 (Primary): 10 (Interlab)							<50.0	<50.0	0	<50.0	<10.0	0
cis-1,2-dichloroethene	µg/L	5 (Primary): 1 (Interlab)							<5.0	<5.0	0	<5.0	<1.0	0
cis-1,3-dichloropropene	µg/L	5 (Primary): 1 (Interlab)							<5.0	<5.0	0	<5.0	<1.0	0
cis-1,4-Dichloro-2-butene	µg/L	5							<5.0	<5.0	0	<5.0		
Dibromomethane	µg/L	5 (Primary): 1 (Interlab)							<5.0	<5.0	0	<5.0	<1.0	0
Dichlorodifluoromethane	µg/L	50 (Primary): 10 (Interlab)							<50.0	<50.0	0	<50.0	<10.0	0
Hexachlorobutadiene	µg/L	5 (Primary): 1 (Interlab)							<5.0	<5.0	0	<5.0	<1.0	0
Iodomethane	µg/L	5							<5.0	<5.0	0	<5.0		
Isopropylbenzene	µg/L	5 (Primary): 1 (Interlab)							<5.0	<5.0	0	<5.0	<1.0	0
n-butylbenzene	µg/L	5 (Primary): 1 (Interlab)							<5.0	<5.0	0	<5.0	<1.0	0
n-propylbenzene	µg/L	5 (Primary): 1 (Interlab)							<5.0	<5.0	0	<5.0	<1.0	0
Pentachloroethane	µg/L	5							<5.0	<5.0	0	<5.0		
p-isopropyltoluene	µg/L	5 (Primary): 1 (Interlab)							<5.0	<5.0	0	<5.0	<1.0	0
sec-butylbenzene	µg/L	5 (Primary): 1 (Interlab)							<5.0	<5.0	0	<5.0	<1.0	0
Styrene	µg/L	5 (Primary): 1 (Interlab)							<5.0	<5.0	0	<5.0	<1.0	0
Trichloroethene	µg/L	5 (Primary): 1 (Interlab)							<5.0	<5.0	0	<5.0	<1.0	0
tert-butylbenzene	µg/L	5 (Primary): 1 (Interlab)							<5.0	<5.0	0	<5.0	<1.0	0
Tetrachloroethene	µg/L	5 (Primary): 1 (Interlab)							<5.0	<5.0	0	<5.0	<1.0	0
trans-1,2-dichloroethene	µg/L	5 (Primary): 1 (Interlab)							<5.0	<5.0	0	<5.0	<1.0	0
trans-1,3-dichloropropene	µg/L	5 (Primary): 1 (Interlab)							<5.0	<5.0	0	<5.0	<1.0	0
trans-1,4-Dichloro-2-butene	µg/L	5							<5.0	<5.0	0	<5.0		
Trichlorofluoromethane	µg/L	50 (Primary): 10 (Interlab)							<50.0	<50.0	0	<50.0	<10.0	0
Vinyl acetate	µg/L	50							<50.0	<50.0	0	<50.0		
Vinyl chloride	µg/L	50 (Primary): 10 (Interlab)							<50.0	<50.0	0	<50.0	<10.0	0

\*RPDs have only been considered where a concentration is greater than 1 times the EQL.

\*\*High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (1-10 x EQL); 30 (10-20 x EQL); 30 (> 20 x EQL) )

\*\*\*Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

1. RPD exceeds the acceptable limit however concentration is well below the adopted guideline value therefore this non-conformance is unlikely to materially effect the outcomes of this investigation.
2. The RPD marginally exceeds the acceptable criteria and this non-conformance is unlikely to materially effect the outcomes of this investigation.
3. The concentration is close to the laboratory detection limit and the elevated RPD is a result of the small different between the low concentrations. This RPD non-conformance is unlikely to materially effect the outcomes of this investigation.
4. The RPD exceeds the acceptable criteria. Metal concentrations are considered within the range of background concentrations and this non-conformance is unlikely to materially effect the outcomes of this investigation.
5. The RPD exceeds the acceptable limits. The higher value was reported for conservatism.

ES1327569 MH_MW02 16/12/2013 15:23	Interlab_D T01_161213CF 16/12/2013 15:23	RPD	ES1327849 MH_MW01 17/12/2013 9:30	ES1327849 D01_171213CF 17/12/2013 9:30	RPD	ES1327988 ML_MW05 19/12/2013 12:15	ES1327988 DUP01_191213DB 19/12/2013 12:15	RPD	ES1327849 MH_MW01 17/12/2013 9:30	Interlab_D T01_171213_CF 17/12/2013 9:30	RPD
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Method_Type	ChemName	Units											
Alkalinity by PC Titrator	Alkalinity (Bicarbonate as CaCO3)	mg/l				92.0	106.0	14	657.0	681.0	4	92.0	
	Alkalinity (Carbonate as CaCO3)	mg/l				<1.0	<1.0	0	<1.0	<1.0	0	<1.0	
	Alkalinity (Hydroxide) as CaCO3	µg/l				<1000.0	<1000.0	0	<1000.0	<1000.0	0	<1000.0	
	Alkalinity (total) as CaCO3	mg/l				92.0	106.0	14	657.0	681.0	4	92.0	
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyse	Sulphate (Filtered)	mg/l				1070.0	1030.0	4	219.0	224.0	2	1070.0	
	Sulphate as S (Filtered)	mg/l	18.0										
Chloride by Discrete Analyser	Chloride	mg/l	14.0	10.0	33	68.0	68.0	0	391.0	388.0	1	68.0	61.0 11
Ferrous Iron by Discrete Analyser	Ferrous Iron	µg/l	2500.0	2500.0	0	860.0	860.0	0	440.0	260.0	51	860.0	
Fluoride by PC Titrator	Fluoride	mg/l	<0.1	<0.1	0	<0.1	<0.1	0	0.3	0.3	0	<0.1	
Ionic Balance by PCT DA and Turbi SO4 DA	Anions Total	meq/L				26.0	25.5	2	28.7	29.2	2	26.0	
	Cations Total	meq/L				26.7	26.1	2	28.2	28.0	1	26.7	
	Ionic Balance	%				1.22	1.26	3	0.94	2.11	77	1.22	1.1 10
Major Cations - Dissolved	Calcium	µg/l	22000.0	19000.0	15	168000.0	166000.0	1	127000.0	126000.0	1	168000.0	160000.0 5
	Magnesium	µg/l	11000.0	9100.0	19	104000.0	101000.0	3	169000.0	168000.0	1	104000.0	98000.0 6
	Potassium (Filtered)	µg/l	10000.0	7900.0	23	27000.0	26000.0	4	23000.0	23000.0	0	27000.0	26000.0 4
	Sodium (Filtered)	mg/l	14.0	12.0	15	208.0	204.0	2	169.0	168.0	1	208.0	220.0 6
Dissolved Mercury by FIMS	Mercury	µg/l	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.05 0
Dissolved Metals by ICP-MS - Suite A	Arsenic	µg/l				1.0			10.0	8.0	22	1.0	<1.0 0
	Boron	µg/l							<50.0	<50.0	0		
	Cadmium	µg/l				0.8			<0.1	<0.1	0	0.8	0.6 29
	Chromium (III+VI)	µg/l				2.0			<1.0	<1.0	0	2.0	<1.0 67
	Copper	µg/l				4.0			<1.0	2.0	67	4.0	2.0 67
	Lead	µg/l				<1.0			4.0	3.0	29	<1.0	<1.0 0
	Manganese	µg/l							1780.0	1790.0	1		
	Nickel	µg/l				312.0			120.0	130.0	8	312.0	300.0 4
	Selenium	µg/l							<10.0	<10.0	0		
	Zinc	µg/l				440.0			13.0	24.0	59	440.0	290.0 41
Dissolved Metals in Fresh Water -Suite A by ORC-I	Arsenic	µg/L	0.7	2.0	96								
	Boron	µg/L	39.0	33.0	17								
	Cadmium	µg/L	<0.05	0.1	67								
	Chromium (III+VI)	µg/L	<0.2	<1.0	0								
	Copper	µg/L	<0.5	<1.0	0								
	Lead	µg/L	0.1	<1.0	0								
	Manganese	µg/L	354.0	1700.0	131								
	Nickel	µg/L	31.4	17.0	60								
Dissolved Metals in Fresh Water -Suite B by ORC-I	Zinc	µg/L	57.0	43.0	28								
	Selenium	µg/L	<0.2	<1.0	0								
PAH/Phenols (GC/MS - SIM)	2,4,5-trichlorophenol	µg/L	<1.0			<1.0	<1.0	0	<1.0	<1.0	0	<1.0	
	2,4,6-trichlorophenol	µg/L	<1.0			<1.0	<1.0	0	<1.0	<1.0	0	<1.0	
	2,4-dichlorophenol	µg/L	<1.0			<1.0	<1.0	0	<1.0	<1.0	0	<1.0	
	2,4-dimethylphenol	µg/L	<1.0			<1.0	<1.0	0	<1.0	<1.0	0	<1.0	
	2,6-dichlorophenol	µg/L	<1.0			<1.0	<1.0	0	<1.0	<1.0	0	<1.0	
	2-chlorophenol	µg/L	<1.0			<1.0	<1.0	0	<1.0	<1.0	0	<1.0	
	2-methylphenol	µg/L	<1.0			<1.0	<1.0	0	<1.0	<1.0	0	<1.0	
	2-nitrophenol	µg/L	<1.0			<1.0	<1.0	0	<1.0	<1.0	0	<1.0	
	3-&4-methylphenol	µg/L	<2.0			<2.0	<2.0	0	<2.0	<2.0	0	<2.0	
	4-chloro-3-methylphenol	µg/L	<1.0			<1.0	<1.0	0	<1.0	<1.0	0	<1.0	
	Acenaphthene	µg/L	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0 0
	Acenaphthylene	µg/L	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0 0
	Anthracene	µg/L	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0 0
	Benz(a)anthracene	µg/L	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0 0
	Benzo(a) pyrene	µg/L	<0.5	<1.0	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<1.0 0
	Benzo(b)fluoranthene	µg/L	<1.0			<1.0	<1.0	0	<1.0	<1.0	0	<1.0	
	Benzo(g,h,i)perylene	µg/L	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0 0
Benzo(k)fluoranthene	µg/L	<1.0			<1.0	<1.0	0	<1.0	<1.0	0	<1.0		
Naphthalene	µg/L	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0 0	
Chrysene	µg/L	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0 0	

	Dibenz(a,h)anthracene	µg/L	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Fluoranthene	µg/L	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Fluorene	µg/L	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Indeno(1,2,3-c,d)pyrene	µg/L	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Phenanthrene	µg/L	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Pyrene	µg/L	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Pentachlorophenol	µg/L	<2.0			<2.0	<2.0	0	<2.0	<2.0	0	<2.0		
	PAHs (Sum of total)	µg/L	<0.5	<1.0	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<1.0	0
	Phenol	µg/L	<1.0			<1.0	<1.0	0	<1.0	<1.0	0	<1.0		
	Carcinogenic PAHs (as BaP TEQ)	µg/L	<0.5	<5.0	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<5.0	0
Polychlorinated Biphenyls (PCB)	PCBs (Sum of total)	µg/L							<1.0	<1.0	0			
TPH - Semivolatile Fraction	TRH >C10-C14 Fraction	µg/L	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0
	TRH >C15-C28 Fraction	µg/L	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C29-C36 Fraction	µg/L	<50.0	<100.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<100.0	0
	TRH >C10-C36 Fraction	µg/L	<50.0			<50.0	<50.0	0	<50.0	<50.0	0	<50.0		
	TRH >C10-C16 Fraction	µg/L	<100.0	<50.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<50.0	0
	TRH >C10-C16 less Naphthalene (F2)	µg/L	<100.0	<50.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<50.0	0
	TRH >C16-C34 Fraction	µg/L	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C34-C40 Fraction	µg/L	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C10-C40 Fraction	µg/L	<100.0			<100.0	<100.0	0	<100.0	<100.0	0	<100.0		
TPH Volatiles/BTEX	Benzene	µg/L	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Toluene	µg/L	<2.0	<1.0	0	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<1.0	0
	Ethylbenzene	µg/L	<2.0	<1.0	0	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<1.0	0
	Xylene (o)	µg/L	<2.0	<1.0	0	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<1.0	0
	Xylene (m & p)	µg/L	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	0
	Xylene Total	µg/L	<2.0			<2.0	<2.0	0	<2.0	<2.0	0	<2.0		
	Total BTEX	µg/L	<1.0			<1.0	<1.0	0	<1.0	<1.0	0	<1.0		
	TRH >C6-C9 Fraction	µg/L	<20.0	<10.0	0	<20.0	<20.0	0	<20.0	<20.0	0	<20.0	<10.0	0
	TRH >C6-C10 Fraction	µg/L	<20.0	<10.0	0	<20.0	<20.0	0	<20.0	<20.0	0	<20.0	<10.0	0
	TRH >C6-C10 less BTEX (F1)	µg/L	<20.0	<10.0	0	<20.0	<20.0	0	<20.0	<20.0	0	<20.0	<10.0	0
	Naphthalene	µg/L	<5.0	<1.0	0	<5.0	<5.0	0	<5.0	<5.0	0	<5.0	<1.0	0
Volatile Organic Compounds	1,1,1,2-tetrachloroethane	µg/L							<5.0	<5.0	0			
	1,1,1-trichloroethane	µg/L							<5.0	<5.0	0			
	1,1,2-tetrachloroethane	µg/L							<5.0	<5.0	0			
	1,1,2-trichloroethane	µg/L							<5.0	<5.0	0			
	1,1-dichloroethane	µg/L							<5.0	<5.0	0			
	1,1-dichloroethene	µg/L							<5.0	<5.0	0			
	1,1-dichloropropene	µg/L							<5.0	<5.0	0			
	1,2,3-trichlorobenzene	µg/L							<5.0	<5.0	0			
	1,2,3-trichloropropane	µg/L							<5.0	<5.0	0			
	1,2,4-trichlorobenzene	µg/L							<5.0	<5.0	0			
	1,2,4-trimethylbenzene	µg/L							<5.0	<5.0	0			
	1,2-dibromo-3-chloropropane	µg/L							<5.0	<5.0	0			
	1,2-dibromoethane	µg/L							<5.0	<5.0	0			
	1,2-dichlorobenzene	µg/L							<5.0	<5.0	0			
	1,2-dichloroethane	µg/L							<5.0	<5.0	0			
	1,2-dichloropropane	µg/L							<5.0	<5.0	0			
	1,3,5-trimethylbenzene	µg/L							<5.0	<5.0	0			
	1,3-dichlorobenzene	µg/L							<5.0	<5.0	0			
	1,3-dichloropropane	µg/L							<5.0	<5.0	0			
	1,4-dichlorobenzene	µg/L							<5.0	<5.0	0			
	2,2-dichloropropane	µg/L							<5.0	<5.0	0			
	2-chlorotoluene	µg/L							<5.0	<5.0	0			
	Methyl Ethyl Ketone	µg/L							<50.0	<50.0	0			
	2-hexanone (MBK)	µg/L							<50.0	<50.0	0			
	4-chlorotoluene	µg/L							<5.0	<5.0	0			
	4-Methyl-2-pentanone	µg/L							<50.0	<50.0	0			
	Bromobenzene	µg/L							<5.0	<5.0	0			
	Bromodichloromethane	µg/L							<5.0	<5.0	0			
	Bromoform	µg/L							<5.0	<5.0	0			
	Bromomethane	µg/L							<50.0	<50.0	0			
	Carbon disulfide	µg/L							<5.0	<5.0	0			
	Carbon tetrachloride	µg/L							<5.0	<5.0	0			
	Naphthalene	µg/L							<7.0	<7.0	0			

Chlorobenzene	µg/L									<5.0	<5.0	0		
Chlorodibromomethane	µg/L									<5.0	<5.0	0		
Chloroethane	µg/L									<50.0	<50.0	0		
Chloroform	µg/L									<5.0	<5.0	0		
Chloromethane	µg/L									<50.0	<50.0	0		
cis-1,2-dichloroethene	µg/L									<5.0	<5.0	0		
cis-1,3-dichloropropene	µg/L									<5.0	<5.0	0		
cis-1,4-Dichloro-2-butene	µg/L									<5.0	<5.0	0		
Dibromomethane	µg/L									<5.0	<5.0	0		
Dichlorodifluoromethane	µg/L									<50.0	<50.0	0		
Hexachlorobutadiene	µg/L									<5.0	<5.0	0		
Iodomethane	µg/L									<5.0	<5.0	0		
Isopropylbenzene	µg/L									<5.0	<5.0	0		
n-butylbenzene	µg/L									<5.0	<5.0	0		
n-propylbenzene	µg/L									<5.0	<5.0	0		
Pentachloroethane	µg/L									<5.0	<5.0	0		
p-isopropyltoluene	µg/L									<5.0	<5.0	0		
sec-butylbenzene	µg/L									<5.0	<5.0	0		
Styrene	µg/L									<5.0	<5.0	0		
Trichloroethene	µg/L									<5.0	<5.0	0		
tert-butylbenzene	µg/L									<5.0	<5.0	0		
Tetrachloroethene	µg/L									<5.0	<5.0	0		
trans-1,2-dichloroethene	µg/L									<5.0	<5.0	0		
trans-1,3-dichloropropene	µg/L									<5.0	<5.0	0		
trans-1,4-Dichloro-2-butene	µg/L									<5.0	<5.0	0		
Trichlorofluoromethane	µg/L									<50.0	<50.0	0		
Vinyl acetate	µg/L									<50.0	<50.0	0		
Vinyl chloride	µg/L									<50.0	<50.0	0		

\*RPDs have only been considered where a concentration is greater than 1 times the EQL.

\*\*High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (1-10 x EQL); 30 (10-20 x

\*\*\*Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any m

1. RPD exceeds the acceptable limit however concentration is well below the adopted guideline value therefore this non-conformance is unlikely to materially effect the outcomes of this investigation.
2. The RPD marginally exceeds the acceptable criteria and this non-conformance is unlikely to materially effect the outcomes of this investigation.
3. The concentration is close to the laboratory detection limit and the elevated RPD is a result of the small different between the low concentrations. This RPD non-conformance is unlikely to materially effect the outcomes of this investigation.
4. The RPD exceeds the acceptable criteria. Metal concentrations are considered within the range of background concentrations and this non-confirmation is unlikely to materially effect the outcomes of this investigation.
5. The RPD exceeds the acceptable limits. The higher value was reported for conservatism.



Method Type	ChemName	Units	EQL	ES1324232 TE_MW16 MA_X_MW16 5/11/2013 15:26	ES1324232 D03_GW_051113 MA_X_MW16 5/11/2013 15:26	RPD	ES1324556 MH_X_D17 MH_X_D17 8/11/2013 10:05	ES1324556 D04_GW_081113 MH_X_D17 8/11/2013 10:05	RPD	ES1324556 MH_X_D17 MH_X_D17 8/11/2013 10:05	Interlab_D T01_GW_081113 MH_X_D17 8/11/2013 10:05	RPD
Alkalinity by PC Titrator	Alkalinity (Bicarbonate as CaCO3)	mg/l	1	83.0		0	123.0	119.0	3	123.0		
	Alkalinity (Carbonate as CaCO3)	mg/l	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0		
	Alkalinity (Hydroxide) as CaCO3	µg/l	1000	<1000.0	<1000.0	0	<1000.0	<1000.0	0	<1000.0		
	Alkalinity (total) as CaCO3	mg/l	1	83.0	83.0	0	123.0	119.0	3	123.0		
Chloride by Discrete Analyser	Chloride	mg/l	1	42.0	40.0	5	38.0	37.0	3	38.0	33.0	14
Dissolved Mercury by FIMS	Mercury	µg/l	0.1 (Primary): 0.05 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.05	0
Dissolved Metals by ICP-MS - Suite A	Arsenic	µg/l	1	7.0	7.0	0	8.0	8.0	0	8.0	7.0	13
	Boron	µg/l	50 (Primary): 5 (Interlab)	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	40.0	0
	Cadmium	µg/l	0.1	0.1	0.1	0	<0.1	<0.1	0	<0.1	<0.1	0
	Chromium (III+VI)	µg/l	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Copper	µg/l	1	3.0	3.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Iron	µg/l	50 (Primary): 10 (Interlab)	32500.0	33000.0	2	9120.0	9960.0	9	9120.0	9600.0	5
	Lead	µg/l	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Manganese	µg/l	1 (Primary): 5 (Interlab)	6820.0	6420.0	6	936.0	1080.0	14	936.0	1200.0	25
	Nickel	µg/l	1	20.0	20.0	0	14.0	16.0	13	14.0	14.0	0
	Selenium	µg/l	10 (Primary): 1 (Interlab)	<10.0	<10.0	0	<10.0	<10.0	0	<10.0	<1.0	0
Zinc	µg/l	5 (Primary): 1 (Interlab)	95.0	102.0	7	51.0	40.0	24	51.0	41.0	22	
Fluoride by PC Titrator	Fluoride	mg/l	0.1	<0.1	<0.1	0	0.4	0.4	0	0.4	0.41	2
Ionic Balance by PCT DA and Turbi S	Anions Total	meq/L	0.01	4.78	4.76	0	16.2	16.1	1	16.2		
	Cations Total	meq/L	0.01	4.25	4.25	0	16.8	17.0	1	16.8		
	Ionic Balance	%	0.01	5.92	5.69	4	1.64	2.84	54	1.64	2.6	45
Major Cations - Dissolved	Calcium	µg/l	1000 (Primary): 500 (Interlab)	11000.0	12000.0	9	157000.0	162000.0	3	157000.0	170000.0	8
	Magnesium	µg/l	1000 (Primary): 500 (Interlab)	14000.0	14000.0	0	79000.0	79000.0	0	79000.0	77000.0	3
	Potassium (Filtered)	µg/l	1000 (Primary): 500 (Interlab)	6000.0	6000.0	0	15000.0	15000.0	0	15000.0	14000.0	7
	Sodium (Filtered)	mg/l	1 (Primary): 0.5 (Interlab)	55.0	54.0	2	47.0	47.0	0	47.0	55.0	16
PAH/Phenols (GC/MS - SIM)	2,4,5-trichlorophenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0		
	2,4,6-trichlorophenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0		
	2,4-dichlorophenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0		
	2,4-dimethylphenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0		
	2,6-dichlorophenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0		
	2-chlorophenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0		
	2-methylphenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0		
	2-nitrophenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0		
	3-&4-methylphenol	µg/L	2	<2.0	<2.0	0	<2.0	<2.0	0	<2.0		
	4-chloro-3-methylphenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0		
	Acenaphthene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Acenaphthylene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Anthracene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Benzo(a)anthracene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Benzo(a) pyrene	µg/L	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<1.0	0
	Benzo(b)fluoranthene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Benzo(g,h,i)perylene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Benzo(k)fluoranthene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Naphthalene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Chrysene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Dibenz(a,h)anthracene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Fluoranthene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Fluorene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Indeno(1,2,3-c,d)pyrene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Phenanthrene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Pyrene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Pentachlorophenol	µg/L	2	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	0
	PAHs (Sum of total)	µg/L	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Phenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	
Carcinogenic PAHs (as BaP TEQ)	µg/L	0.5 (Primary): 5 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<5.0	0	
Polychlorinated Biphenyls (PCB)	PCBs (Sum of total)	µg/L	1	<1.0	<1.0	0						
Sulfate (Turbidimetric) as SO4 2- by D	Sulphate (Filtered)	mg/l	1	93.0	95.0	2	610.0	608.0	0	610.0		
TPH - Semivolatile Fraction	TRH >C10-C14 Fraction	µg/L	50	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0
	TRH >C15-C28 Fraction	µg/L	100	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C29-C36 Fraction	µg/L	50 (Primary): 100 (Interlab)	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<100.0	0
	TRH >C10-C36 Fraction	µg/L	50	<50.0	<50.0	0	<50.0	<50.0	0	<50.0		
	TRH >C10-C16 Fraction	µg/L	100 (Primary): 50 (Interlab)	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<50.0	0
	TRH >C10-C16 less Naphthalene (F2)	µg/L	100 (Primary): 50 (Interlab)	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<50.0	0
	TRH >C16-C34 Fraction	µg/L	100	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C34-C40 Fraction	µg/L	100	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0
TRH >C10-C40 Fraction	µg/L	100	<100.0	<100.0	0	<100.0	<100.0	0	<100.0			
TPH Volatiles/BTEX	Benzene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0



	Toluene	µg/L	2 (Primary): 1 (Interlab)	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<1.0	0
	Ethylbenzene	µg/L	2 (Primary): 1 (Interlab)	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<1.0	0
	Xylene (o)	µg/L	2 (Primary): 1 (Interlab)	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<1.0	0
	Xylene (m & p)	µg/L	2	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	0
	Xylene Total	µg/L	2	<2.0	<2.0	0	<2.0	<2.0	0	<2.0		
	Total BTEX	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0		
	TRH >C6-C9 Fraction	µg/L	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<20.0	0	<20.0	<10.0	0
	TRH >C6-C10 Fraction	µg/L	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<20.0	0	<20.0	<10.0	0
	TRH >C6-C10 less BTEX (F1)	µg/L	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<20.0	0	<20.0	<10.0	0
	Naphthalene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<5.0	0	<5.0	<1.0	0
Volatile Organic Compounds	1,1,1,2-tetrachloroethane	µg/L	5	<5.0	<5.0	0						
	1,1,1-trichloroethane	µg/L	5	<5.0	<5.0	0						
	1,1,2,2-tetrachloroethane	µg/L	5	<5.0	<5.0	0						
	1,1,2-trichloroethane	µg/L	5	<5.0	<5.0	0						
	1,1-dichloroethane	µg/L	5	<5.0	<5.0	0						
	1,1-dichloroethene	µg/L	5	<5.0	<5.0	0						
	1,1-dichloropropene	µg/L	5	<5.0	<5.0	0						
	1,2,3-trichlorobenzene	µg/L	5	<5.0	<5.0	0						
	1,2,3-trichloropropane	µg/L	5	<5.0	<5.0	0						
	1,2,4-trichlorobenzene	µg/L	5	<5.0	<5.0	0						
	1,2,4-trimethylbenzene	µg/L	5	<5.0	<5.0	0						
	1,2-dibromo-3-chloropropane	µg/L	5	<5.0	<5.0	0						
	1,2-dibromoethane	µg/L	5	<5.0	<5.0	0						
	1,2-dichlorobenzene	µg/L	5	<5.0	<5.0	0						
	1,2-dichloroethane	µg/L	5	<5.0	<5.0	0						
	1,2-dichloropropane	µg/L	5	<5.0	<5.0	0						
	1,3,5-trimethylbenzene	µg/L	5	<5.0	<5.0	0						
	1,3-dichlorobenzene	µg/L	5	<5.0	<5.0	0						
	1,3-dichloropropane	µg/L	5	<5.0	<5.0	0						
	1,4-dichlorobenzene	µg/L	5	<5.0	<5.0	0						
	2,2-dichloropropane	µg/L	5	<5.0	<5.0	0						
	2-chlorotoluene	µg/L	5	<5.0	<5.0	0						
	Methyl Ethyl Ketone	µg/L	50	<50.0	<50.0	0						
	2-hexanone (MBK)	µg/L	50	<50.0	<50.0	0						
	4-chlorotoluene	µg/L	5	<5.0	<5.0	0						
	4-Methyl-2-pentanone	µg/L	50	<50.0	<50.0	0						
	Bromobenzene	µg/L	5	<5.0	<5.0	0						
	Bromodichloromethane	µg/L	5	<5.0	<5.0	0						
	Bromoform	µg/L	5	<5.0	<5.0	0						
	Bromomethane	µg/L	50	<50.0	<50.0	0						
	Carbon disulfide	µg/L	5	<5.0	<5.0	0						
	Carbon tetrachloride	µg/L	5	<5.0	<5.0	0						
	Naphthalene	µg/L	7	<7.0	<7.0	0						
	Chlorobenzene	µg/L	5	<5.0	<5.0	0						
	Chlorodibromomethane	µg/L	5	<5.0	<5.0	0						
	Chloroethane	µg/L	50	<50.0	<50.0	0						
	Chloroform	µg/L	5	<5.0	<5.0	0						
	Chloromethane	µg/L	50	<50.0	<50.0	0						
	cis-1,2-dichloroethene	µg/L	5	<5.0	<5.0	0						
	cis-1,3-dichloropropene	µg/L	5	<5.0	<5.0	0						
	cis-1,4-Dichloro-2-butene	µg/L	5	<5.0	<5.0	0						
	Dibromomethane	µg/L	5	<5.0	<5.0	0						
	Dichlorodifluoromethane	µg/L	50	<50.0	<50.0	0						
	Hexachlorobutadiene	µg/L	5	<5.0	<5.0	0						
	Iodomethane	µg/L	5	<5.0	<5.0	0						
Isopropylbenzene	µg/L	5	<5.0	<5.0	0							
n-butylbenzene	µg/L	5	<5.0	<5.0	0							
n-propylbenzene	µg/L	5	<5.0	<5.0	0							
Pentachloroethane	µg/L	5	<5.0	<5.0	0							
p-isopropyltoluene	µg/L	5	<5.0	<5.0	0							
sec-butylbenzene	µg/L	5	<5.0	<5.0	0							
Styrene	µg/L	5	<5.0	<5.0	0							
Trichloroethene	µg/L	5	<5.0	<5.0	0							
tert-butylbenzene	µg/L	5	<5.0	<5.0	0							
Tetrachloroethene	µg/L	5	<5.0	<5.0	0							
trans-1,2-dichloroethene	µg/L	5	<5.0	<5.0	0							
trans-1,3-dichloropropene	µg/L	5	<5.0	<5.0	0							
trans-1,4-Dichloro-2-butene	µg/L	5	<5.0	<5.0	0							
Trichlorofluoromethane	µg/L	50	<50.0	<50.0	0							
Vinyl acetate	µg/L	50	<50.0	<50.0	0							
Vinyl chloride	µg/L	50	<50.0	<50.0	0							

\*RPDs have only been considered where a concentration is greater than 1 times the EQL.

\*\*High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (1-10 x EQL); 30 (10-20 x EQL); 30 (> 20 x EQL) )

\*\*\*Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

1. RPD exceeds the acceptable limit however concentration is well below the adopted guideline value therefore this non-conformance is unlikely to materially effect the outcomes of this investigation.
2. The RPD marginally exceeds the acceptable criteria and this non-conformance is unlikely to materially effect the outcomes of this investigation.
3. The concentration is close to the laboratory detection limit and the elevated RPD is a result of the small different between the low concentrations. This RPD non-conformance is unlikely to materially effect the outcomes of this investigation.
4. The RPD exceeds the acceptable limits. The higher value was reported for conservatism.
5. The RPD exceeds the acceptable criteria. Metal concentrations are considered within the range of background concentrations and this non-conformance is unlikely to materially effect the outcomes of this investigation.

SDG	ES1325528	ES1325528	
Field_ID	WL_SS40	WL_SS40	RPD
Loc Code	MM_SS40	MM_SS40	
Sampled_Date-Time	22/11/2013	22/11/2013	

Method_Type	ChemName	Units	EQL			
PAH/Phenols (SIM)	2,4,5-trichlorophenol	mg/kg	0.5	<0.5	<0.5	0
	2,4,6-trichlorophenol	mg/kg	0.5	<0.5	<0.5	0
	2,4-dichlorophenol	mg/kg	0.5	<0.5	<0.5	0
	2,4-dimethylphenol	mg/kg	0.5	<0.5	<0.5	0
	2,6-dichlorophenol	mg/kg	0.5	<0.5	<0.5	0
	2-chlorophenol	mg/kg	0.5	<0.5	<0.5	0
	2-methylphenol	mg/kg	0.5	<0.5	<0.5	0
	2-nitrophenol	mg/kg	0.5	<0.5	<0.5	0
	3-&4-methylphenol	mg/kg	1	<1.0	<1.0	0
	4-chloro-3-methylphenol	mg/kg	0.5	<0.5	<0.5	0
	Acenaphthene	mg/kg	0.5	<0.5	<0.5	0
	Acenaphthylene	mg/kg	0.5	<0.5	<0.5	0
	Anthracene	mg/kg	0.5	<0.5	<0.5	0
	Benz(a)anthracene	mg/kg	0.5	<0.5	<0.5	0
	Benzo(a) pyrene	mg/kg	0.5	<0.5	<0.5	0
	Benzo(b)fluoranthene	mg/kg	0.5	<0.5	<0.5	0
	Benzo(g,h,i)perylene	mg/kg	0.5	<0.5	<0.5	0
	Benzo(k)fluoranthene	mg/kg	0.5	<0.5	<0.5	0
	Carcinogenic PAHs (as B(a)P TEQ (h	mg/kg	0.5	0.6	0.6	0
	Carcinogenic PAHs (as B(a)P TEQ (L	mg/kg	0.5	1.2	1.2	0
	Naphthalene	mg/kg	0.5	<0.5	<0.5	0
	Chrysene	mg/kg	0.5	<0.5	<0.5	0
	Dibenz(a,h)anthracene	mg/kg	0.5	<0.5	<0.5	0
	Fluoranthene	mg/kg	0.5	<0.5	<0.5	0
	Fluorene	mg/kg	0.5	<0.5	<0.5	0
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	<0.5	<0.5	0
	Phenanthrene	mg/kg	0.5	<0.5	<0.5	0
	Pyrene	mg/kg	0.5	<0.5	<0.5	0
	Pentachlorophenol	mg/kg	2	<2.0	<2.0	0
	PAHs (Sum of total)	mg/kg	0.5	<0.5	<0.5	0
	Phenol	mg/kg	0.5	<0.5	<0.5	0
	Carcinogenic PAHs (as BaP TEQ)	mg/kg	0.5	<0.5	<0.5	0
Total Mercury by FIMS	Mercury	mg/kg	0.1	<0.1	<0.1	0
Total Metals by ICP-AES	Arsenic	mg/kg	5	<b>&lt;5.0</b>	<b>16.0</b>	<b>105</b>
	Cadmium	mg/kg	1	<1.0	<1.0	0
	Chromium (III+VI)	mg/kg	2	<b>61.0</b>	<b>37.0</b>	<b>49</b>
	Copper	mg/kg	5	<b>21.0</b>	<b>8.0</b>	<b>90</b>
	Lead	mg/kg	5	56.0	58.0	4
	Nickel	mg/kg	2	<b>24.0</b>	<b>7.0</b>	<b>110</b>
	Selenium	mg/kg	5	<5.0	<5.0	0
	Zinc	mg/kg	5	<b>89.0</b>	<b>51.0</b>	<b>54</b>
TPH - Semivolatile Fraction	TRH >C10-C14 Fraction	mg/kg	50	<50.0	<50.0	0
	TRH >C15-C28 Fraction	mg/kg	100	<100.0	<100.0	0
	TRH >C29-C36 Fraction	mg/kg	100	<100.0	<100.0	0
	TRH >C10-C36 Fraction	mg/kg	50	<50.0	<50.0	0
	TRH >C10-C16 Fraction	mg/kg	50	<50.0	<50.0	0
	TRH >C10-C16 less Naphthalene (F2)	mg/kg	50	<50.0	<50.0	0
	TRH >C16-C34 Fraction	mg/kg	100	<100.0	<100.0	0
	TRH >C34-C40 Fraction	mg/kg	100	<100.0	<100.0	0
	TRH >C10-C40 Fraction	mg/kg	50	<50.0	<50.0	0
TPH Volatiles/BTEX	Benzene	mg/kg	0.2	<0.2	<0.2	0
	Ethylbenzene	mg/kg	0.5	<0.5	<0.5	0
	Toluene	mg/kg	0.5	<0.5	<0.5	0
	TRH >C6-C9 Fraction	mg/kg	10	<10.0	<10.0	0
	Total BTEX	mg/kg	0.2	<0.2	<0.2	0
	Xylene (m & p)	mg/kg	0.5	<0.5	<0.5	0
	TRH >C6-C10 Fraction	mg/kg	10	<10.0	<10.0	0
	Xylene (o)	mg/kg	0.5	<0.5	<0.5	0
	TRH >C6-C10 less BTEX (F1)	mg/kg	10	<10.0	<10.0	0
	Xylene Total	mg/kg	0.5	<0.5	<0.5	0
	Naphthalene	mg/kg	1	<1.0	<1.0	0

\*RPDs have only been considered where a concentration is greater than 1 times the EQL.

\*\*High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (1-10 x EQL); 30 (10-20 x EQL); 30 (> 20 x EQL))

\*\*\*Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the p

1. Soil and sediment samples were not homogenised prior to sampling to minimise volatilisation of volatile contaminants. The elevated RPD is likely a result of the heterogeneity of the soil matrix. The concentration is well below the adopted guidelines value (where available) and therefore this RPD non-conformance is unlikely to materially effect the outcomes of this investigation.

2. Soil and sediment samples were not homogenised prior to sampling to minimise volatilisation of volatile contaminants. The elevated RPD is likely a result of the heterogeneity of the soil matrix. The RPD marginally exceeds the acceptable criteria and this non-conformance is unlikely to materially effect the outcomes of this investigation.

3. The concentration is close to the laboratory detection limit and the elevated RPD is a result of the small difference between the low concentrations. This RPD non-conformance is unlikely to materially effect the outcomes of this investigation.

SDG	ES1325530	ES1325530	RPD	ES1325530	ES1325530	RPD
Field_ID	WL_SS19	WL_SSC		WL_SS39	WL_SSE	
Loc Code	MM_SS19	MM_SS19		MM_SS39	MM_SS39	
Sampled_Date-Time	21/11/2013	21/11/2013		22/11/2013	22/11/2013	

Method Type	ChemName	Units	EQL						
Fluoride by PC Titrator	Fluoride	mg/l	0.1						
PAH/Phenols (GC/MS - SIM)	2,4,5-trichlorophenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	2,4,6-trichlorophenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	2,4-dichlorophenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	2,4-dimethylphenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	2,6-dichlorophenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	2-chlorophenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	2-methylphenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	2-nitrophenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	3-&4-methylphenol	µg/L	2	<2.0	<2.0	0	<2.0	<2.0	0
	4-chloro-3-methylphenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	Acenaphthene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	Acenaphthylene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	Anthracene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	Benz(a)anthracene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	Benzo(a) pyrene	µg/L	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo(b)fluoranthene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	Benzo(g,h,i)perylene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	Benzo(k)fluoranthene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	Naphthalene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	Chrysene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	Dibenz(a,h)anthracene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	Fluoranthene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	Fluorene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	Indeno(1,2,3-c,d)pyrene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	Phenanthrene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	Pyrene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	Pentachlorophenol	µg/L	2	<2.0	<2.0	0	<2.0	<2.0	0
	PAHs (Sum of total)	µg/L	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Phenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	Carcinogenic PAHs (as BaP TEQ)	µg/L	0.5	<0.5	<0.5	0	<0.5	<0.5	0
Total Mercury by FIMS	Mercury	µg/l	0.1	<0.1	<0.1	0	<0.1	<0.1	0
Total Metals by ICP-MS - Suite A	Arsenic	µg/l	1	1.0	<1.0	0	<1.0	<1.0	0
	Boron	µg/l	50	100.0	90.0	11	110.0	120.0	9
	Cadmium	µg/l	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Chromium (III+VI)	µg/l	1	<1.0	<1.0	0	<1.0	<1.0	0
	Copper	µg/l	1	3.0	3.0	0	2.0	2.0	0
	Lead	µg/l	1	<1.0	<1.0	0	<1.0	<1.0	0
	Manganese	µg/l	1	26.0	27.0	4	8.0	8.0	0
	Nickel	µg/l	1	<b>4.0</b>	<b>2.0</b>	<b>67</b>	2.0	2.0	0
	Selenium	µg/l	10	<10.0	<10.0	0	<10.0	<10.0	0
	Zinc	µg/l	5	8.0	10.0	22	8.0	<5.0	46
TPH - Semivolatile Fraction	TRH >C10-C14 Fraction	µg/L	50	<50.0	<50.0	0	<50.0	<50.0	0
	TRH >C15-C28 Fraction	µg/L	100	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C29-C36 Fraction	µg/L	50	<50.0	<50.0	0	<50.0	<50.0	0
	TRH >C10-C36 Fraction	µg/L	50	<50.0	<50.0	0	<50.0	<50.0	0
	TRH >C10-C16 Fraction	µg/L	100	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C10-C16 less Naphthalene (F2)	µg/L	100	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C16-C34 Fraction	µg/L	100	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C34-C40 Fraction	µg/L	100	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C10-C40 Fraction	µg/L	100	<100.0	<100.0	0	<100.0	<100.0	0
TPH Volatiles/BTEX	Benzene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	Ethylbenzene	µg/L	2	<2.0	<2.0	0	<2.0	<2.0	0
	Toluene	µg/L	2	<2.0	<2.0	0	<2.0	<2.0	0
	TRH >C6-C9 Fraction	µg/L	20	<20.0	<20.0	0	<20.0	<20.0	0
	Total BTEX	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0
	Xylene (m & p)	µg/L	2	<2.0	<2.0	0	<2.0	<2.0	0
	TRH >C6-C10 Fraction	µg/L	20	<20.0	<20.0	0	<20.0	<20.0	0
	Xylene (o)	µg/L	2	<2.0	<2.0	0	<2.0	<2.0	0
	TRH >C6-C10 less BTEX (F1)	µg/L	20	<20.0	<20.0	0	<20.0	<20.0	0
	Xylene Total	µg/L	2	<2.0	<2.0	0	<2.0	<2.0	0
	Naphthalene	µg/L	5	<5.0	<5.0	0	<5.0	<5.0	0

\*RPDs have only been considered where a concentration is greater than 1 times the EQL.

\*\*High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (1-10 x EQL); 30 (10-20 x EQL); 30 (> 20 x EQL) )

\*\*\*Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

1. RPD exceeds the acceptable limit however concentration is well below the adopted guideline value therefore this non-conformance is unlikely to materially effect the outcomes of this investigation.
2. The RPD marginally exceeds the acceptable criteria and this non-conformance is unlikely to materially effect the outcomes of this investigation.
3. The concentration is close to the laboratory detection limit and the elevated RPD is a result of the small difference between the low concentrations. This RPD non-conformance is unlikely to materially effect the outcomes of this investigation.
4. The RPD exceeds the acceptable limits. The higher value was reported for conservatism.
5. The RPD exceeds the acceptable criteria. Metal concentrations are considered within the range of background concentrations and this non-conformance is unlikely to materially effect the outcomes of this investigation.



Method Type	ChemName	Units	EQL	SDG	ES1323856	ES1323856	ES1323856	ES1324232	ES1324556
				Field_ID	RB_GW3_311013	RB_GW4_011113	RB_GW5_041113	RB_GW6_051113	RB_GW7_061113
				Sampled_Date-Time	31/10/2013 15:00	1/11/2013 15:00	4/11/2013 15:00	5/11/2013 15:00	5/11/2013 15:00
Sample_Type		Rinsate	Rinsate	Rinsate	Rinsate	Rinsate			
Alkalinity by PC Titrator	Alkalinity (Bicarbonate as CaCO3)	mg/l	1		<1			<1	<1
	Alkalinity (Carbonate as CaCO3)	mg/l	1		<1			<1	<1
	Alkalinity (Hydroxide) as CaCO3	µg/l	1000		<1000			<1000	<1000
	Alkalinity (total) as CaCO3	mg/l	1		<1			<1	<1
Chloride by Discrete Analyser	Chloride	mg/l	1		<1			<1	<1
Dissolved Mercury by FIMS	Mercury	µg/l	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
Dissolved Metals by ICP-MS - Suite A	Arsenic	µg/l	0.001		<1	<1	<1	<1	<1
	Boron	µg/l	0.05		<50	<50	<50	<50	<50
	Cadmium	µg/l	0.0001		<0.1	<0.1	<0.1	<0.1	<0.1
	Chromium (III+VI)	µg/l	0.001		<1	<1	<1	<1	<1
	Copper	µg/l	0.001		<1	<1	<1	<1	<1
	Iron	µg/l	50		<50	<50	<50	110	<50
	Lead	µg/l	0.001		<1	<1	<1	<1	<1
	Manganese	µg/l	0.001		<1	<1	<1	1	<1
	Nickel	µg/l	0.001		<1	<1	<1	<1	<1
	Selenium	µg/l	0.01		<10	<10	<10	<10	<10
	Zinc	µg/l	0.005		<5	<5	<5	<5	<5
Fluoride by PC Titrator	Fluoride	mg/l	0.1		<0.1			<0.1	<0.1
Ionic Balance by PCT DA and Turbi SO4 DA	Anions Total	meq/L	0.01		<0.01			<0.01	<0.01
	Cations Total	meq/L	0.01		<0.01			<0.01	<0.01
	Ionic Balance	%	0.01					<0.01	<0.01
Leachable Metals by ICPAES	Nickel	µg/l	100						
Major Cations - Dissolved	Calcium	µg/l	1000		<1000			<1000	<1000
	Magnesium	µg/l	1000		<1000			<1000	<1000
	Potassium (Filtered)	µg/l	1000		<1000			<1000	<1000
	Sodium (Filtered)	mg/l	1		<1			<1	<1
PAH/Phenols (GC/MS - SIM)	2,4,5-trichlorophenol	µg/L	1		<1	<1	<1	<1	<1
	2,4,6-trichlorophenol	µg/L	1		<1	<1	<1	<1	<1
	2,4-dichlorophenol	µg/L	1		<1	<1	<1	<1	<1
	2,4-dimethylphenol	µg/L	1		<1	<1	<1	<1	<1
	2,6-dichlorophenol	µg/L	1		<1	<1	<1	<1	<1
	2-chlorophenol	µg/L	1		<1	<1	<1	<1	<1
	2-methylphenol	µg/L	1		<1	<1	<1	<1	<1
	2-nitrophenol	µg/L	1		<1	<1	<1	<1	<1
	3-&4-methylphenol	µg/L	2		<2	<2	<2	<2	<2
	4-chloro-3-methylphenol	µg/L	1		<1	<1	<1	<1	<1
	Acenaphthene	µg/L	1		<1	<1	<1	<1	<1
	Acenaphthylene	µg/L	1		<1	<1	<1	<1	<1
	Anthracene	µg/L	1		<1	<1	<1	<1	<1
	Benz(a)anthracene	µg/L	1		<1	<1	<1	<1	<1
	Benzo(a) pyrene	µg/L	0.5		<0.5	<0.5	<0.5	<0.5	<0.6
	Benzo(b)fluoranthene	µg/L	1		<1	<1	<1	<1	<1
	Benzo(g,h,i)perylene	µg/L	1		<1	<1	<1	<1	<1
	Benzo(k)fluoranthene	µg/L	1		<1	<1	<1	<1	<1
	Naphthalene	µg/L	1		<1	<1	<1	<1	<1
	Chrysene	µg/L	1		<1	<1	<1	<1	<1
	Dibenz(a,h)anthracene	µg/L	1		<1	<1	<1	<1	<1
	Fluoranthene	µg/L	1		<1	<1	<1	<1	<1
	Fluorene	µg/L	1		<1	<1	<1	<1	<1
	Indeno(1,2,3-c,d)pyrene	µg/L	1		<1	<1	<1	<1	<1
	Phenanthrene	µg/L	1		<1	<1	<1	<1	<1
	Pyrene	µg/L	1		<1	<1	<1	<1	<1
	Pentachlorophenol	µg/L	2		<2	<2	<2	<2	<2
	PAHs (Sum of total)	µg/L	0.5		<0.5	<0.5	<0.5	<0.5	<0.5
	Phenol	µg/L	1		<1	<1	<1	<1	<1
	Carcinogenic PAHs (as BaP TEQ)	µg/L	0.5		<0.5	<0.5	<0.5	<0.5	<0.5
Polychlorinated Biphenyls (PCB)	PCBs (Sum of total)	µg/L	1		<1			<1	
Sulfate (Turbidimetric) as SO4 2- by Discrete Anal	Sulphate (Filtered)	mg/l	1		<1			<1	<1
Total Mercury by FIMS	Mercury	µg/l	0.1						
Total Metals by ICP-MS - Suite A	Arsenic	µg/l	1						
	Boron	µg/l	50						
	Cadmium	µg/l	0.1						
	Chromium (III+VI)	µg/l	1						
	Copper	µg/l	1						
	Lead	µg/l	1						
	Manganese	µg/l	1						
	Nickel	µg/l	1						
	Selenium	µg/l	10						
	Zinc	µg/l	5						
Total Metals in Fresh Water -Suite A by ORC-ICPMS	Arsenic	µg/L	0.2						
	Boron	µg/L	5						
	Cadmium	µg/L	0.05						
	Chromium (III+VI)	µg/L	0.2						
	Copper	µg/L	0.5						
	Lead	µg/L	0.1						
	Manganese	µg/L	0.5						
	Nickel	µg/L	0.5						
	Zinc	µg/L	1						
Total Metals in Fresh Water -Suite B by ORC-ICPMS	Selenium	µg/L	0.2						

		SDG		ES1323856	ES1323856	ES1323856	ES1324232	ES1324556
		Field_ID		RB_GW3_311013	RB_GW4_011113	RB_GW5_041113	RB_GW6_051113	RB_GW7_061113
		Sampled_Date-Time		31/10/2013 15:00	1/11/2013 15:00	4/11/2013 15:00	5/11/2013 15:00	5/11/2013 15:00
		Sample_Type		Rinsate	Rinsate	Rinsate	Rinsate	Rinsate
TPH - Semivolatile Fraction	TRH >C10-C14 Fraction	µg/L	50	<50	<50	<50	<50	<50
	TRH >C15-C28 Fraction	µg/L	100	<100	<100	<100	<100	<100
	TRH >C29-C36 Fraction	µg/L	50	<50	<50	<50	<50	
	TRH >C10-C36 Fraction	µg/L	50	<50	<50	<50	<50	
	TRH >C10-C16 Fraction	µg/L	100	<100	<100	<100	<100	
	TRH >C10-C16 less Naphthalene (F2)	µg/L	100	<100	<100	<100	<100	
	TRH >C16-C34 Fraction	µg/L	100	<100	<100	<100	<100	
	TRH >C34-C40 Fraction	µg/L	100	<100	<100	<100	<100	
	TRH >C10-C40 Fraction	µg/L	100	<100	<100	<100	<100	
TPH Volatiles/BTEX	Benzene	µg/L	1	<1	<1	<1	<1	<1
	Toluene	µg/L	2	<2	<2	<2	<2	
	Ethylbenzene	µg/L	2	<2	<2	<2	<2	
	Xylene (o)	µg/L	2	<2	<2	<2	<2	
	Xylene (m & p)	µg/L	2	<2	<2	<2	<2	
	Xylene Total	µg/L	2	<2	<2	<2	<2	
	Total BTEX	µg/L	1	<1	<1	<1	<1	
	TRH >C6-C9 Fraction	µg/L	20	<20	<20	<20	<20	
	TRH >C6-C10 Fraction	µg/L	20	<20	<20	<20	<20	
	TRH >C6-C10 less BTEX (F1)	µg/L	20	<20	<20	<20	<20	
	Naphthalene	µg/L	5	<5	<5	<5	<5	
Volatile Organic Compounds	1,1,1,2-tetrachloroethane	µg/L	5	<5			<5	
	1,1,1-trichloroethane	µg/L	5	<5			<5	
	1,1,2,2-tetrachloroethane	µg/L	5	<5			<5	
	1,1,2-trichloroethane	µg/L	5	<5			<5	
	1,1-dichloroethane	µg/L	5	<5			<5	
	1,1-dichloroethene	µg/L	5	<5			<5	
	1,1-dichloropropene	µg/L	5	<5			<5	
	1,2,3-trichlorobenzene	µg/L	5	<5			<5	
	1,2,3-trichloropropane	µg/L	5	<5			<5	
	1,2,4-trichlorobenzene	µg/L	5	<5			<5	
	1,2,4-trimethylbenzene	µg/L	5	<5			<5	
	1,2-dibromo-3-chloropropane	µg/L	5	<5			<5	
	1,2-dibromoethane	µg/L	5	<5			<5	
	1,2-dichlorobenzene	µg/L	5	<5			<5	
	1,2-dichloroethane	µg/L	5	<5			<5	
	1,2-dichloropropane	µg/L	5	<5			<5	
	1,3,5-trimethylbenzene	µg/L	5	<5			<5	
	1,3-dichlorobenzene	µg/L	5	<5			<5	
	1,3-dichloropropane	µg/L	5	<5			<5	
	1,4-dichlorobenzene	µg/L	5	<5			<5	
	2,2-dichloropropane	µg/L	5	<5			<5	
	2-chlorotoluene	µg/L	5	<5			<5	
	Methyl Ethyl Ketone	µg/L	50	<50			<50	
	2-hexanone (MBK)	µg/L	50	<50			<50	
	4-chlorotoluene	µg/L	5	<5			<5	
	4-Methyl-2-pentanone	µg/L	50	<50			<50	
	Bromobenzene	µg/L	5	<5			<5	
	Bromodichloromethane	µg/L	5	<5			<5	
	Bromoform	µg/L	5	<5			<5	
	Bromomethane	µg/L	50	<50			<50	
	Carbon disulfide	µg/L	5	<5			<5	
	Carbon tetrachloride	µg/L	5	<5			<5	
	Naphthalene	µg/L	7	<7			<7	
	Chlorobenzene	µg/L	5	<5			<5	
	Chlorodibromomethane	µg/L	5	<5			<5	
	Chloroethane	µg/L	50	<50			<50	
	Chloroform	µg/L	5	<5			<5	
	Chloromethane	µg/L	50	<50			<50	
	cis-1,2-dichloroethene	µg/L	5	<5			<5	
	cis-1,3-dichloropropene	µg/L	5	<5			<5	
	cis-1,4-Dichloro-2-butene	µg/L	5	<5			<5	
	Dibromomethane	µg/L	5	<5			<5	
	Dichlorodifluoromethane	µg/L	50	<50			<50	
	Hexachlorobutadiene	µg/L	5	<5			<5	
	Iodomethane	µg/L	5	<5			<5	
	Isopropylbenzene	µg/L	5	<5			<5	
	n-butylbenzene	µg/L	5	<5			<5	
	n-propylbenzene	µg/L	5	<5			<5	
	Pentachloroethane	µg/L	5	<5			<5	
	p-isopropyltoluene	µg/L	5	<5			<5	
sec-butylbenzene	µg/L	5	<5			<5		
Styrene	µg/L	5	<5			<5		
Trichloroethene	µg/L	5	<5			<5		
tert-butylbenzene	µg/L	5	<5			<5		
Tetrachloroethene	µg/L	5	<5			<5		
trans-1,2-dichloroethene	µg/L	5	<5			<5		
trans-1,3-dichloropropene	µg/L	5	<5			<5		
trans-1,4-Dichloro-2-butene	µg/L	5	<5			<5		
Trichlorofluoromethane	µg/L	50	<50			<50		
Vinyl acetate	µg/L	50	<50			<50		
Vinyl chloride	µg/L	50	<50			<50		









SDG Field_ID Sampled_Date-Time Sample_Type	ES1322435 TRIP BLANK 8/10/2013 15:00 Trip_B	ES1324233 TRIP BLANK 30/10/2013 15:00 Trip_B	ES1323862 TRIP BLANK 31/10/2013 15:00 Trip_B	ES1324470 TRIP BLANK 4/11/2013 15:00 Trip_B	ES1324472 TRIP BLANK 4/11/2013 15:00 Trip_B	ES1324473 TRIP BLANK 4/11/2013 15:00 Trip_B	ES1324879 TB 13/11/2013 15:00 Trip_B
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Method_Type	ChemName	Units	EQL							
TPH Volatiles/BTEX	Benzene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Toluene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Ethylbenzene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Xylene (o)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Xylene (m & p)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Xylene Total	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Total BTEX	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	TRH >C6-C9 Fraction	mg/kg	10	<10	<10	<10	<10	<10	<10	<10
	TRH >C6-C10 Fraction	mg/kg	10	<10	<10	<10	<10	<10	<10	<10
	TRH >C6-C10 less BTEX (F1)	mg/kg	10	<10	<10	<10	<10	<10	<10	<10
	Naphthalene	mg/kg	1	<1	<1	<1	<1	<1	<1	<1

ES1325219	ES1325472	ES1325783	ES1325900	ES1325970
TRIP BLANK	TB	TRIP BLANK	TRIP BLANK	TRIP BLANK
18/11/2013 15:00	20/11/2013 15:00	20/11/2013 15:00	26/11/2013 15:00	27/11/2013 15:00
Trip_B	Trip_B	Trip_B	Trip_B	Trip_B

Method_Type	ChemName	Units					
TPH Volatiles/BTEX	Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
	Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
	Ethylbenzene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
	Xylene (o)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
	Xylene (m & p)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
	Xylene Total	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
	Total BTEX	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
	TRH >C6-C9 Fraction	mg/kg	<10	<10	<10	<10	<10
	TRH >C6-C10 Fraction	mg/kg	<10	<10	<10	<10	<10
	TRH >C6-C10 less BTEX (F1)	mg/kg	<10	<10	<10	<10	<10
	Naphthalene	mg/kg	<1	<1	<1	<1	<1



SDG	ES1323856	ES1324232	ES1324232	ES1324556	ES1327569	ES1327570	ES1328041	ES1328002	ES1328001	ES1327988	ES1327997
Field_ID	TB	TB	TB	TB	TB	TB (2)	TB5	TB2	TB3	TB	TB4
Sampled_Date-Time	30/10/2013 15:00	30/10/2013 15:00	30/10/2013 15:00	30/10/2013 15:00	16/12/2013 15:00	16/12/2013 15:00	17/12/2013 15:00	18/12/2013 15:00	19/12/2013 13:00	19/12/2013 15:00	19/12/2013 15:00
Sample_Type	Trip_B	Trip_B	Trip_B	Trip_B	Trip_B	Trip_B	Trip_B	Trip_B	Trip_B	Trip_B	Trip_B

Method_Type	ChemName	Units	EQL											
TPH Volatiles/BTEX	Benzene	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Toluene	µg/L	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Ethylbenzene	µg/L	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Xylene (o)	µg/L	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Xylene (m & p)	µg/L	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Xylene Total	µg/L	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Total BTEX	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	TRH >C6-C9 Fraction	µg/L	20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	TRH >C6-C10 Fraction	µg/L	20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	TRH >C6-C10 less BTEX (F1)	µg/L	20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	Naphthalene	µg/L	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5



<b>SDG</b>	ES1325530
<b>Field_ID</b>	TRIP BLANK
<b>Sampled_Date-Time</b>	22/11/2013 15:00
<b>Sample_Type</b>	Trip_B

Method_Type	ChemName	Units	EQL	
TPH Volatiles/BTEX	Benzene	µg/L	1	<1
	Ethylbenzene	µg/L	2	<2
	Toluene	µg/L	2	<2
	TRH >C6-C9 Fraction	µg/L	20	<20
	Total BTEX	µg/L	1	<1
	Xylene (m & p)	µg/L	2	<2
	TRH >C6-C10 Fraction	µg/L	20	<20
	Xylene (o)	µg/L	2	<2
	TRH >C6-C10 less BTEX (F1)	µg/L	20	<20
	Xylene Total	µg/L	2	<2
	Naphthalene	µg/L	5	<5



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Trip Spike Recoveries (70% - 130% is acceptable)

SDG	SampleCode	Field ID	Compound	Trip_Spike_Result	Trip_Spike_Control	Result Units	Spike_Recovery_%	Acceptable
ES1323862	ES1323862005	TRIP SPIKE	Benzene	0.4	0.6	mg/kg	67	N
ES1324233	ES1324233001	TRIP SPIKE 13	Ethylbenzene	2.6	1.8	mg/kg	144	N
ES1324233	ES1324233001	TRIP SPIKE 13	meta- & para-Xylene	12.5	9.4	mg/kg	133	N
ES1324233	ES1324233001	TRIP SPIKE 13	ortho-Xylene	5.1	3.6	mg/kg	142	N
ES1324233	ES1324233001	TRIP SPIKE 13	Total Xylenes	17.6	13	mg/kg	135	N
ES1324470	ES1324470039	TRIP SPIKE	C6 - C9 Fraction	25	81	mg/kg	31	N
ES1324470	ES1324470039	TRIP SPIKE	C6 - C10 Fraction	28	90	mg/kg	31	N
ES1324470	ES1324470039	TRIP SPIKE	C6 - C10 Fraction minus BTEX (F1)	14	58	mg/kg	24	N
ES1324470	ES1324470039	TRIP SPIKE	Benzene	0.3	0.7	mg/kg	43	N
ES1324470	ES1324470039	TRIP SPIKE	Ethylbenzene	0.7	2.1	mg/kg	33	N
ES1324470	ES1324470039	TRIP SPIKE	meta- & para-Xylene	4	10	mg/kg	40	N
ES1324470	ES1324470039	TRIP SPIKE	ortho-Xylene	1.6	3.9	mg/kg	41	N
ES1324470	ES1324470039	TRIP SPIKE	Sum of BTEX	14.1	32.4	mg/kg	44	N
ES1324470	ES1324470039	TRIP SPIKE	Toluene	7.5	15.7	mg/kg	48	N
ES1324470	ES1324470039	TRIP SPIKE	Total Xylenes	5.6	13.9	mg/kg	40	N
ES1324472	ES1324472005	TRIP SPIKE (14)	C6 - C9 Fraction	61	101	mg/kg	60	N
ES1324472	ES1324472005	TRIP SPIKE (14)	C6 - C10 Fraction	71	111	mg/kg	64	N
ES1324472	ES1324472005	TRIP SPIKE (14)	C6 - C10 Fraction minus BTEX (F1)	40	69	mg/kg	58	N
ES1324472	ES1324472005	TRIP SPIKE (14)	Benzene	0.4	0.9	mg/kg	44	N
ES1324472	ES1324472005	TRIP SPIKE (14)	Toluene	15.6	22.3	mg/kg	70	N
ES1324473	ES1324473001	TRIP SPIKE 2	C6 - C9 Fraction	53	115	mg/kg	46	N
ES1324473	ES1324473001	TRIP SPIKE 2	C6 - C10 Fraction	62	128	mg/kg	48	N
ES1324473	ES1324473001	TRIP SPIKE 2	C6 - C10 Fraction minus BTEX (F1)	32	84	mg/kg	38	N
ES1324473	ES1324473001	TRIP SPIKE 2	Benzene	0.5	1.1	mg/kg	45	N
ES1324473	ES1324473001	TRIP SPIKE 2	Ethylbenzene	2.1	3.1	mg/kg	68	N
ES1324473	ES1324473001	TRIP SPIKE 2	Sum of BTEX	30.5	43.7	mg/kg	70	N
ES1324473	ES1324473001	TRIP SPIKE 2	Toluene	13.8	20.6	mg/kg	67	N
ES1325472	ES1325472012	TS3	C6 - C10 Fraction minus BTEX (F1)	18	28	mg/kg	64	N
ES1325783	ES1325783010	TRIP SPIKE	Benzene	0.4	0.6	mg/kg	67	N
ES1325970	ES1325970015	TRIP SPIKE	C6 - C9 Fraction	<10	54	mg/kg	19	N
ES1325970	ES1325970015	TRIP SPIKE	C6 - C10 Fraction	<10	63	mg/kg	16	N
ES1325970	ES1325970015	TRIP SPIKE	C6 - C10 Fraction minus BTEX (F1)	<10	34	mg/kg	29	N
ES1325970	ES1325970015	TRIP SPIKE	Benzene	<0.2	0.4	mg/kg	50	N
ES1325970	ES1325970015	TRIP SPIKE	Ethylbenzene	<0.5	1.8	mg/kg	28	N
ES1325970	ES1325970015	TRIP SPIKE	meta- & para-Xylene	0.9	8.7	mg/kg	10	N
ES1325970	ES1325970015	TRIP SPIKE	ortho-Xylene	<0.5	3.6	mg/kg	14	N
ES1325970	ES1325970015	TRIP SPIKE	Sum of BTEX	2.6	28.5	mg/kg	9	N
ES1325970	ES1325970015	TRIP SPIKE	Toluene	1.7	14	mg/kg	12	N
ES1325970	ES1325970015	TRIP SPIKE	Total Xylenes	0.9	12.3	mg/kg	7	N





Table F8b. Laboratory Supplied Trip Spike Results and Recoveries (%) - Groundwater  
 Mt Piper Power Station - Stage 2 ESA  
 Project Symphony - 0207423

					TPH Volatiles/BTEX									
					Benzene	Spike Recovery	Toluene	Spike Recovery	Ethylbenzene	Spike Recovery	Xylene (o)	Spike Recovery	Xylene (m & p)	Spike Recovery
					µg/L	%	µg/L	%	µg/L	%	µg/L	%	µg/L	%
EQL					1		2		2		2		2	
Field_ID	Sampled_Date	SDG	SampleCode	Sample_Type	15	75	16	80	15	75	16	80	15	75
TS	30/10/2013	ES1323856	ES1323856013	Trip_S	15	75	16	80	15	75	16	80	15	75
TS	30/10/2013	ES1324232	ES1324232007	Trip_S	16	80	16	80	16	80	18	90	16	80
TS	30/10/2013	ES1324232	ES1324232013	Trip_S	15	75	15	75	16	80	18	90	16	80
TS	30/10/2013	ES1324556	ES1324556007	Trip_S	15	75	16	80	15	75	17	85	16	80
TS	16/12/2013	ES1327569	ES1327569006	Trip_S	16	80	16	80	16	80	18	90	15	75
TS	19/12/2013	ES1327988	ES1327988007	Trip_S	17	85	18	90	17	85	17	85	17	85
TS (5)	16/12/2013	ES1327570	ES1327570008	Trip_S	15	75	15	75	15	75	15	75	15	75
TS3	18/12/2013	ES1328002	ES1328002008	Trip_S	17	85	17	85	16	80	16	80	16	80
TS4	19/12/2013	ES1328001	ES1328001007	Trip_S	18	90	18	90	17	85	17	85	17	85
TS4	19/12/2013	ES1327997	ES1327997003	Trip_S	18	90	19	95	18	90	19	95	18	90
TS5	17/12/2013	ES1328041	ES1328041011	Trip_S	18	90	17	85	16	80	17	85	16	80



Table F8c. Laboratory Supplied Trip Spike Results and Recoveries (%) - Sediment  
 Mt Piper Power Station - Stage 2 ESA  
 Project Symphony - 0207423

SDG	SampleCode	Field_ID	Compound	Trip_Spike_Result	Trip_Spike_Control	Result_Units	Spike_Recovery_%	Acceptable
ES1325528	ES1325528019	TRIP SPIKE	C6 - C9 Fraction	36	42	mg/kg	86	Y
ES1325528	ES1325528019	TRIP SPIKE	C6 - C10 Fraction	41	48	mg/kg	85	Y
ES1325528	ES1325528019	TRIP SPIKE	C6 - C10 Fraction minus BTEX (F1)	22	26	mg/kg	85	Y
ES1325528	ES1325528019	TRIP SPIKE	Benzene	0.2	0.3	mg/kg	67	Y
ES1325528	ES1325528019	TRIP SPIKE	Ethylbenzene	1.2	1.3	mg/kg	92	Y
ES1325528	ES1325528019	TRIP SPIKE	meta- & para-Xylene	5.8	6.7	mg/kg	87	Y
ES1325528	ES1325528019	TRIP SPIKE	Naphthalene	<1	<1	mg/kg	100	Y
ES1325528	ES1325528019	TRIP SPIKE	ortho-Xylene	2.5	2.8	mg/kg	89	Y
ES1325528	ES1325528019	TRIP SPIKE	Sum of BTEX	18.9	22	mg/kg	86	Y
ES1325528	ES1325528019	TRIP SPIKE	Toluene	9.2	10.9	mg/kg	84	Y
ES1325528	ES1325528019	TRIP SPIKE	Total Xylenes	8.3	9.5	mg/kg	87	Y



Table F8d. Laboratory Supplied Trip Spike Results and Recoveries (%) - Surface Water  
 Mt Piper Power Station - Stage 2 ESA  
 Project Symphony - 0207423

														TPH Volatiles/BTEX									
														Benzene	Spike Recovery	Ethylbenzene	Spike Recovery	Toluene	Spike Recovery	Xylene (m & p)	Spike Recovery	Xylene (o)	Spike Recovery
														µg/L	%	µg/L	%	µg/L	%	µg/L	%	µg/L	%
EQL														1		2		2		2		2	
Field ID	Sampled Date-Time	SDG	SampleCode	Sample_Type	19	95	18	90	20	100	19	95	20	100									
TRIP SPIKE	22/11/2013	ES1325530	ES1325530022	Trip_S																			



SDG	SampleCode	Field_ID	Sampled_Date-Time	ChemName	Result	Sampled_to_Extraction_Days	Sampled_to_Analysis_Days
ES1324233	ES1324233002	TRIP BLANK	30/10/2013	Ethylbenzene	0.5 mg/kg	15	15
ES1324233	ES1324233002	TRIP BLANK	30/10/2013	Xylene (m & p)	0.5 mg/kg	15	15
ES1324233	ES1324233002	TRIP BLANK	30/10/2013	Toluene	0.5 mg/kg	15	15
ES1324233	ES1324233002	TRIP BLANK	30/10/2013	Xylene Total	0.5 mg/kg	15	15
ES1324233	ES1324233002	TRIP BLANK	30/10/2013	Benzene	0.2 mg/kg	15	15
ES1324233	ES1324233002	TRIP BLANK	30/10/2013	Xylene (o)	0.5 mg/kg	15	15
ES1324233	ES1324233002	TRIP BLANK	30/10/2013	TRH >C6-C9 Fraction	10 mg/kg	15	15
ES1324233	ES1324233002	TRIP BLANK	30/10/2013	Naphthalene	1 mg/kg	15	15
ES1324233	ES1324233002	TRIP BLANK	30/10/2013	Total BTEX	0.2 mg/kg	15	15
ES1402022	ES1402022001	MG_SB03_0.2	13/11/2013	Mercury	0.1 mg/kg	83	84
ES1402022	ES1402022002	MG_SB02_0.1	13/11/2013	Mercury	0.1 mg/kg	83	84



SDG	Sample_Type	Field_ID	Sampled_Date	Compound	Recovery %	LCL	UCL	Comments
ES1324716	LAB_D		11/11/2013	2-Chlorophenol-D4	125	66	122	Recovery greater than upper data quality objective
ES1324716	MS		11/11/2013	Phenol-d6	127	63	123	Recovery greater than upper data quality objective
ES1324716	MS		11/11/2013	2-Chlorophenol-D4	124	66	122	Recovery greater than upper data quality objective
ES1322146	Normal	D02_091013_TS	9/10/2013	4-Bromofluorobenzene	132	71.6	130	Recovery greater than upper data quality objective
ES1323858	Normal	ML_MW05_2.9	31/10/2013	1,2-Dichloroethane-D4	1	64	130	NDSurrogate recovery not determined due to (target or non-target) matrix interferences
ES1324880	Normal	MH_GRAB_01	13/11/2013	Toluene-D8	73.8	73.9	132.1	Recovery less than lower data quality objective
ES1324880	Normal	MH_GRAB_01	13/11/2013	4-Bromofluorobenzene	51.2	71.6	130	Recovery less than lower data quality objective
ES1325219	Normal	MH_MW01_8.0	18/11/2013	4-Bromofluorobenzene	61.7	71.6	130	Recovery less than lower data quality objective
ES1325783	Normal	MK_SB42_3.5	21/11/2013	1,2-Dichloroethane-D4	71.5	72.8	133.2	Recovery less than lower data quality objective



SDG	Sample_Type	Field_ID	Sampled_Date	Compound	Recovery %	LCL%	UCL%	Comments
ES1321739	MB		4/10/2013	2-Fluorobiphenyl	110	26.6	107	Recovery greater than upper control limit
ES1321739	LCS		4/10/2013	2,4,6-Tribromophenol	123	22.1	122	Recovery greater than upper control limit
ES1321739	LCS		4/10/2013	2-Fluorobiphenyl	108	26.6	107	Recovery greater than upper control limit
ES1323856	LCS		9/11/2013	1,2-Dichloroethane-D4	131	68	130	Recovery greater than upper control limit
ES1324556	MB		14/11/2013	Anthracene-d10	118	37	113	Recovery greater than upper control limit
ES1328001	LCS		23/12/2013	4-Terphenyl-d14	122	40	116	Recovery greater than upper control limit
ES1328003	LCS		23/12/2013	4-Terphenyl-d14	122	40	116	Recovery greater than upper control limit
ES1327997	LCS		23/12/2013	Anthracene-d10	115	37	113	Recovery greater than upper control limit
ES1328000	LCS		23/12/2013	Anthracene-d10	115	37	113	Recovery greater than upper control limit
ES1328002	LCS		23/12/2013	Anthracene-d10	115	37	113	Recovery greater than upper control limit
ES1321739	Normal	MWMP_01	3/10/2013	4-Bromofluorobenzene	124	80.8	123.7	Recovery greater than upper data quality objective
ES1327569	Rinsate	RB01_161213CF	16/12/2013	Phenol-d6	50.8	10	44	Recovery greater than upper data quality objective





Table F11a. Laboratory Control Sample Recovery Exceedances - Soil  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

SDG	SampleCode	OriginalChemName	Recovery %	Result_Type	Comments
ES1322434	3710242-002_ES1322434	Vinyl Acetate	29.2	REG	Recovery less than lower control limit
ES1322662	3717251-002_ES1322662	Vinyl Acetate	26.9	REG	Recovery less than lower control limit
ES1325472	3801855-002_ES1325472	Total Polychlorinated biphenyls	127	REG	Recovery greater than upper control limit



Table F11b. Laboratory Control Sample Recovery Exceedances - Groundwater  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

SDG	SampleCode	OriginalChemName	Recovery %	Result_Type	Comments
ES1321739	3687444-002_ES1321739	Trichlorofluoromethane	132	REG	Recovery greater than upper control limit
ES1328041	3852143-011_ES1328041	2-Chlorophenol	61.1	REG	Recovery less than lower control limit
ES1327849	3852305-008_ES1327849	Fluorene	63.4	REG	Recovery less than lower control limit
ES1327988	3852784-018_ES1327988	2-Chlorophenol	62.5	REG	Recovery less than lower control limit
ES1327997	3855103-002_ES1327997	Vinyl chloride	130	REG	Recovery greater than upper control limit
ES1328000	3855103-002_ES1328000	Vinyl chloride	130	REG	Recovery greater than upper control limit
ES1328001	3855103-002_ES1328001	Vinyl chloride	130	REG	Recovery greater than upper control limit
ES1328002	3855103-002_ES1328002	Vinyl chloride	130	REG	Recovery greater than upper control limit



Table F12a. Laboratory Matrix Spiked Sample Recovery Exceedances - Sediment  
Mt Piper Power Station - Stage 2 ESA  
Project Symphony - 0207423

SDG	SampleCode	Sampled_Date-Time	Compound	Recovery %	Comments
ES1325528	3791358-005_ES1325528001_ES1325528	21/11/2013	Toluene	63.5	Recovery less than lower data quality objective
ES1325528	3791358-005_ES1325528001_ES1325528	21/11/2013	Benzene	56.6	Recovery less than lower data quality objective
ES1325528	3791358-005_ES1325528001_ES1325528	21/11/2013	Naphthalene	65.8	Recovery less than lower data quality objective
ES1325528	3791358-005_ES1325528001_ES1325528	21/11/2013	C6 - C10 Fraction	60	Recovery less than lower data quality objective
ES1325528	3791358-005_ES1325528001_ES1325528	21/11/2013	C6 - C9 Fraction	61.6	Recovery less than lower data quality objective
ES1325528	3798620-005_ES1325412014_ES1325528	21/11/2013	Zinc	232	Recovery greater than upper data quality objective



SDG	Lab Duplicate	Field_ID	Sampled_Date	Compound	Parent_Result	Dupe_Result	Result_Unit	EQL	RPD
ES1325218	3793704-022_ES1325279005_ES1325218	-	20/11/2013	Zinc	222	157	mg/kg	5 mg/kg	34
ES1325473	3796113-054_ES1325491054_ES1325473	-	20/11/2013	Lead	414	593	mg/kg	5 mg/kg	36
ES1325473	3796113-054_ES1325491054_ES1325473	-	20/11/2013	Chromium	40	52	mg/kg	2 mg/kg	26
ES1325473	3796113-054_ES1325491054_ES1325473	-	20/11/2013	Copper	271	407	mg/kg	5 mg/kg	40
ES1325473	3796113-054_ES1325491054_ES1325473	-	20/11/2013	Zinc	3900	4850	mg/kg	5 mg/kg	22



SDG	Lab_Duplicate	Field_ID	Sampled_Date	Compound	Parent_Result	Dupe_Result	Result_Unit	EQL	RPD
ES1321739	3689682-026_ES1321729001_ES1321739		3/10/2013	Lead	3	0.003	µg/L	0.001 µg/L	200
ES1321739	3689682-026_ES1321729001_ES1321739		3/10/2013	Manganese	13	0.013	µg/L	0.001 µg/L	200
ES1321739	3689682-026_ES1321729001_ES1321739		3/10/2013	Nickel	128	0.131	µg/L	0.001 µg/L	200
ES1321739	3689682-026_ES1321729001_ES1321739		3/10/2013	Arsenic	10	0.01	µg/L	0.001 µg/L	200
ES1321739	3689682-026_ES1321729001_ES1321739		3/10/2013	Boron	80	0.09	µg/L	0.05 µg/L	200
ES1321739	3689682-026_ES1321729001_ES1321739		3/10/2013	Cadmium	0.1	0.0001	µg/L	0.0001 µg/L	200
ES1321739	3689682-026_ES1321729001_ES1321739		3/10/2013	Copper	9	0.008	µg/L	0.001 µg/L	200
ES1321739	3689682-026_ES1321729001_ES1321739		3/10/2013	Zinc	36	0.04	µg/L	0.005 µg/L	200
ES1327282	3834182-045_ES1327339003_ES1327282		13/12/2013	Bicarbonate Alkalinity as CaCO3	200	112	mg/L	1 mg/L	56
ES1327282	3834182-045_ES1327339003_ES1327282		13/12/2013	Total Alkalinity as CaCO3	200	112	mg/L	1 mg/L	56
ES1328001	3850855-052_ES1328001001_ES1328001	MK_MW05	19/12/2013	Sodium	54	44	mg/L	1 mg/L	20
ES1328002	3850855-052_ES1328001001_ES1328002		19/12/2013	Sodium	54	44	mg/L	1 mg/L	20

Annex G

Photolog





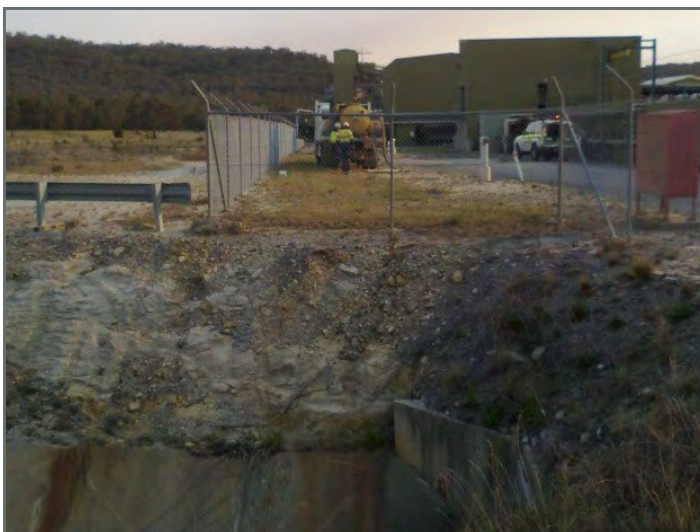
### Photograph 1

Numac conducting non-destructive digging works at MK\_SB09, view east. An open drainage channel can be seen in the foreground and general power station infrastructure in the background.



### Photograph 2

Numac concrete coring at MC\_MW03, view west. Active and disused transformers can be seen along the right of frame.



### Photograph 3

Drainage channel and exposed bedrock between MK\_SB18 and MK\_SB19, view north. Part of the coal conveyor can be seen in the right of frame.



**Photograph 4**

Location of MD\_MW02 (near) and MD\_MW03 (far), view east. The workshop and equipment store is in the right of frame. Hunter-Smith are conducting Ground Penetrating Radar scans in the background.



**Photograph 5**

Location of MH\_MW03, view south. Lamberts North Ash Repository is in the right of frame.



**Photograph 6**

Abandoned septic tank and barricading within the former contractors yard (AEC – ML).





**Photograph 7**

Rock outcropping, red sand and storage shed located within former contractors' yard, view north (AEC – ML).



**Photograph 8**

Abandoned drums located within the former contractors yard, view southeast (AEC – ML).



**Photograph 9**

Abandoned electronic equipment within the former contractors yard, view northwest (AEC – ML).



**Photograph 10**

Abandoned drum in drainage channel within former contractor yard, view east (AEC – ML).



**Photograph 11**

Bulk oil storage in the vicinity of MK\_SB78 and MK\_SB79, view north.



**Photograph 12**

MB\_MW04 location, view northeast. A portion of the coal stockpile and dry storage shed are visible





**Photograph 13**

Water holding ponds and some pumping infrastructure, view northwest (AEC – MI).



**Photograph 14**

Pale grey and orange siltstone outcrop at the Former Contractors Yard (AEC – ML) is typical of site geology.



**Photograph 15**

Coal outcropping at the surface of the Former Contractors Yard (AEC – ML).



**Photograph 16**

Oil interceptor pit located alongside the mobile plant refuelling area and workshop, view east (AEC – ME).



**Photograph 17**

Confirmed LNAPL within bailer sampled from ME\_X\_MWMP7, within the vicinity of the mobile plant refuelling area and workshop.



**Photograph 18**

Confirmed LNAPL within bailer sampled from ME\_X\_MWMP8, within the vicinity of the mobile plant refuelling area and workshop.





**Photograph 19**

Diesel bowsers and location of diesel UST at the mobile plant refuelling area and workshop, view northeast (AEC – ME).



**Photograph 20**

Typical fill material encountered during non-destructive digging works across the investigation area.



**Photograph 21**

Coal washery rejects ponds in the vicinity of MH\_MW01 and MH\_MW02, view northwest.



**Photograph 22**

Dam wall between freshwater dam and the coal washery rejects ponds, view west (AEC – MH).



**Photograph 23**

Fuel bowsers adjacent to workshop, view southeast (AEC – MJ).



**Photograph 24**

Fenced compound around the former general waste landfill, view northeast from access road (AEC – MA).





**Photograph 25**

Thompsons Creek Reservoir, view west from spillway.



**Photograph 26**

Thompsons Creek Reservoir compressor building.



**Photograph 27**

Lake Lyell, view east from public camping area on western shore.



**Photograph 28**

Lake Lyell spillway, view east from pump house.

Annex H

## Laboratory Certificates

**CERTIFICATE OF ANALYSIS**

**100833**

**Client:**

**Environmental Resources Management Australia**

Locked Bag 24

Broadway

NSW 2007

**Attention:** Jonathan Lekawksi

**Sample log in details:**

Your Reference:

**Wallerawang/ Mt Piper GW**

No. of samples:

1 water

Date samples received / completed instructions received

14/11/13

/ 14/11/13

**Analysis Details:**

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

***Please refer to the last page of this report for any comments relating to the results.***

**Report Details:**

Date results requested by: / Issue Date:

21/11/13

/

21/11/13

Date of Preliminary Report:

Not issued

NATA accreditation number 2901. This document shall not be reproduced except in full.

Accredited for compliance with ISO/IEC 17025.

**Tests not covered by NATA are denoted with \*.**

**Results Approved By:**



Jacinta Hurst  
Laboratory Manager



vTRH(C6-C10)/BTEXN in Water		
Our Reference:	UNITS	100833-1
Your Reference	-----	T01_GW_081 113
Date Sampled	-----	08/11/2013
Type of sample		water
Date extracted	-	15/11/2013
Date analysed	-	17/11/2013
TRHC <sub>6</sub> - C <sub>9</sub>	µg/L	<10
TRHC <sub>6</sub> - C <sub>10</sub>	µg/L	<10
TRHC <sub>6</sub> - C <sub>10</sub> less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	109
Surrogate toluene-d8	%	91
Surrogate 4-BFB	%	92

svTRH (C10-C40) in Water		
Our Reference:	UNITS	100833-1
Your Reference	-----	T01_GW_081
		113
Date Sampled	-----	08/11/2013
Type of sample		water
Date extracted	-	15/11/2013
Date analysed	-	18/11/2013
TRHC <sub>10</sub> - C <sub>14</sub>	µg/L	<50
TRHC <sub>15</sub> - C <sub>28</sub>	µg/L	<100
TRHC <sub>29</sub> - C <sub>36</sub>	µg/L	<100
TRH>C <sub>10</sub> - C <sub>16</sub>	µg/L	<50
TRH>C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	µg/L	<50
TRH>C <sub>16</sub> - C <sub>34</sub>	µg/L	<100
TRH>C <sub>34</sub> - C <sub>40</sub>	µg/L	<100
Surrogate o-Terphenyl	%	97

PAHs in Water Our Reference: Your Reference	UNITS -----	100833-1 T01_GW_081 113
Date Sampled Type of sample	-----	08/11/2013 water
Date extracted	-	15/11/2013
Date analysed	-	15/11/2013
Naphthalene	µg/L	<1
Acenaphthylene	µg/L	<1
Acenaphthene	µg/L	<1
Fluorene	µg/L	<1
Phenanthrene	µg/L	<1
Anthracene	µg/L	<1
Fluoranthene	µg/L	<1
Pyrene	µg/L	<1
Benzo(a)anthracene	µg/L	<1
Chrysene	µg/L	<1
Benzo(b+k)fluoranthene	µg/L	<2
Benzo(a)pyrene	µg/L	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1
Dibenzo(a,h)anthracene	µg/L	<1
Benzo(g,h,i)perylene	µg/L	<1
Benzo(a)pyrene TEQ	µg/L	<5
Total +ve PAH's	µg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	116

Total Phenolics in Water		
Our Reference:	UNITS	100833-1
Your Reference	-----	T01_GW_081 113
Date Sampled	-----	08/11/2013
Type of sample		water
Date extracted	-	18/11/2013
Date analysed	-	18/11/2013
Total Phenolics (as Phenol)	mg/L	<0.05

Ion Balance		
Our Reference:	UNITS	100833-1
Your Reference	-----	T01_GW_081
		113
Date Sampled	-----	08/11/2013
Type of sample		water
Date prepared	-	14/11/2013
Date analysed	-	14/11/2013
Calcium - Dissolved	mg/L	170
Potassium - Dissolved	mg/L	14
Sodium - Dissolved	mg/L	55
Magnesium - Dissolved	mg/L	77
Hydroxide Alkalinity (OH <sup>-</sup> ) as CaCO <sub>3</sub>	mg/L	<5
Bicarbonate Alkalinity as CaCO <sub>3</sub>	mg/L	130
Carbonate Alkalinity as CaCO <sub>3</sub>	mg/L	<5
Total Alkalinity as CaCO <sub>3</sub>	mg/L	130
Sulphate, SO <sub>4</sub>	mg/L	630
Chloride, Cl	mg/L	33
Ionic Balance	%	2.6

HM in water - dissolved		
Our Reference:	UNITS	100833-1
Your Reference	-----	T01_GW_081
		113
Date Sampled	-----	08/11/2013
Type of sample		water
Date prepared	-	15/11/2013
Date analysed	-	15/11/2013
Arsenic-Dissolved	µg/L	7
Cadmium-Dissolved	µg/L	<0.1
Chromium-Dissolved	µg/L	<1
Copper-Dissolved	µg/L	<1
Lead-Dissolved	µg/L	<1
Mercury-Dissolved	µg/L	<0.05
Nickel-Dissolved	µg/L	14
Zinc-Dissolved	µg/L	41
Boron-Dissolved	µg/L	40
Iron-Dissolved	µg/L	9,600
Manganese-Dissolved	µg/L	1,200
Selenium-Dissolved	µg/L	<1



**Client Reference: Wallerawang/ Mt Piper GW**

Miscellaneous Inorganics		
Our Reference:	UNITS	100833-1
Your Reference	-----	T01_GW_081 113
Date Sampled	-----	08/11/2013
Type of sample		water
Date prepared	-	14/11/2013
Date analysed	-	14/11/2013
Fluoride, F	mg/L	0.41

MethodID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-013	Water samples are analysed directly by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note Naphthalene is determined from the VOC analysis.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Inorg-030	Total Phenolics - determined colorimetrically following disitillation, based upon APHA 22nd ED 5530 D.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA 22nd ED, 2320-B.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA 22nd ED, 4110-B.
Inorg-041	Gravimetric determination of the total solids content of water using APHA 22nd ED 2540B.
Metals-022 ICP-MS	Determination of various metals by ICP-MS.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-026	Fluoride determined by ion selective electrode (ISE) in accordance with APHA 22nd ED, 4500-F-C.

**Client Reference: Wallerawang/ Mt Piper GW**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
vTRH(C6-C10)/BTEXN in Water						Base II Duplicate II %RPD		
Date extracted	-			15/11/2013	[NT]	[NT]	LCS-W1	15/11/2013
Date analysed	-			17/11/2013	[NT]	[NT]	LCS-W1	17/11/2013
TRHC <sub>6</sub> - C <sub>9</sub>	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W1	112%
TRHC <sub>6</sub> - C <sub>10</sub>	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W1	112%
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	109%
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	112%
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	111%
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	LCS-W1	113%
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	112%
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Surrogate Dibromofluoromethane	%		Org-016	121	[NT]	[NT]	LCS-W1	104%
Surrogate toluene-d8	%		Org-016	77	[NT]	[NT]	LCS-W1	95%
Surrogate 4-BFB	%		Org-016	70	[NT]	[NT]	LCS-W1	97%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
svTRH(C10-C40) in Water						Base II Duplicate II %RPD		
Date extracted	-			15/11/2013	[NT]	[NT]	LCS-W4	15/11/2013
Date analysed	-			18/11/2013	[NT]	[NT]	LCS-W4	18/11/2013
TRHC <sub>10</sub> - C <sub>14</sub>	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W4	76%
TRHC <sub>15</sub> - C <sub>28</sub>	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W4	91%
TRHC <sub>29</sub> - C <sub>36</sub>	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W4	99%
TRH>C <sub>10</sub> - C <sub>16</sub>	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W4	76%
TRH>C <sub>16</sub> - C <sub>34</sub>	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W4	91%
TRH>C <sub>34</sub> - C <sub>40</sub>	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W4	99%
Surrogate o-Terphenyl	%		Org-003	87	[NT]	[NT]	LCS-W4	73%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Water						Base II Duplicate II %RPD		
Date extracted	-			15/11/2013	[NT]	[NT]	LCS-W3	15/11/2013
Date analysed	-			15/11/2013	[NT]	[NT]	LCS-W3	15/11/2013
Naphthalene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W3	116%
Acenaphthylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluorene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W3	126%
Phenanthrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W3	110%

**Client Reference: Wallerawang/ Mt Piper GW**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Water						Base II Duplicate II %RPD		
Anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W3	107%
Pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W3	135%
Benzo(a)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Chrysene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W3	112%
Benzo(b+k)fluoranthene	µg/L	2	Org-012 subset	<2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W3	123%
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	110	[NT]	[NT]	LCS-W3	110%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Total Phenolics in Water						Base II Duplicate II %RPD		
Date extracted	-			18/11/2013	[NT]	[NT]	LCS-W1	18/11/2013
Date analysed	-			18/11/2013	[NT]	[NT]	LCS-W1	18/11/2013
Total Phenolics (as Phenol)	mg/L	0.05	Inorg-030	<0.05	[NT]	[NT]	LCS-W1	96%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Ion Balance						Base II Duplicate II %RPD		
Date prepared	-			15/11/2013	[NT]	[NT]	LCS-W3	15/11/2013
Date analysed	-			15/11/2013	[NT]	[NT]	LCS-W3	15/11/2013
Calcium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-W3	108%
Potassium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-W3	110%
Sodium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-W3	110%
Magnesium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-W3	109%
Hydroxide Alkalinity (OH <sup>-</sup> ) as CaCO <sub>3</sub>	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NR]	[NR]
Bicarbonate Alkalinity as CaCO <sub>3</sub>	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NR]	[NR]
Carbonate Alkalinity as CaCO <sub>3</sub>	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NR]	[NR]

**Client Reference: Wallerawang/ Mt Piper GW**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Ion Balance						Base II Duplicate II %RPD		
Total Alkalinity as CaCO <sub>3</sub>	mg/L	5	Inorg-006	<5	[NT]	[NT]	LCS-W3	102%
Sulphate, SO <sub>4</sub>	mg/L	1	Inorg-081	<1	[NT]	[NT]	LCS-W3	111%
Chloride, Cl	mg/L	1	Inorg-081	<1	[NT]	[NT]	LCS-W3	97%
Ionic Balance	%		Inorg-041	[NT]	[NT]	[NT]	[NR]	[NR]
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
HM in water - dissolved						Base II Duplicate II %RPD		
Date prepared	-			15/11/2013	[NT]	[NT]	LCS-W1	15/11/2013
Date analysed	-			15/11/2013	[NT]	[NT]	LCS-W1	15/11/2013
Arsenic-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	106%
Cadmium-Dissolved	µg/L	0.1	Metals-022 ICP-MS	<0.1	[NT]	[NT]	LCS-W1	104%
Chromium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	98%
Copper-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	95%
Lead-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	107%
Mercury-Dissolved	µg/L	0.05	Metals-021 CV-AAS	<0.05	[NT]	[NT]	LCS-W1	96%
Nickel-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	102%
Zinc-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	117%
Boron-Dissolved	µg/L	5	Metals-022 ICP-MS	<5	[NT]	[NT]	LCS-W1	114%
Iron-Dissolved	µg/L	10	Metals-022 ICP-MS	<10	[NT]	[NT]	LCS-W1	110%
Manganese-Dissolved	µg/L	5	Metals-022 ICP-MS	<5	[NT]	[NT]	LCS-W1	107%
Selenium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	106%

**Client Reference: Wallerawang/ Mt Piper GW**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Miscellaneous Inorganics						Base II Duplicate II %RPD		
Date prepared	-			14/11/2013	[NT]	[NT]	LCS-W1	14/11/2013
Date analysed	-			14/11/2013	[NT]	[NT]	LCS-W1	14/11/2013
Fluoride, F	mg/L	0.1	Inorg-026	<0.1	[NT]	[NT]	LCS-W1	110%
QUALITYCONTROL	UNITS	Dup. Sm#	Duplicate	Spike Sm#	Spike % Recovery			
Ion Balance			Base + Duplicate + %RPD					
Date prepared	-	[NT]	[NT]	100833-1	15/11/2013			
Date analysed	-	[NT]	[NT]	100833-1	15/11/2013			
Calcium - Dissolved	mg/L	[NT]	[NT]	100833-1	#			
Potassium - Dissolved	mg/L	[NT]	[NT]	100833-1	90%			
Sodium - Dissolved	mg/L	[NT]	[NT]	100833-1	#			
Magnesium - Dissolved	mg/L	[NT]	[NT]	100833-1	#			
Hydroxide Alkalinity (OH <sup>-</sup> ) as CaCO <sub>3</sub>	mg/L	[NT]	[NT]	[NR]	[NR]			
Bicarbonate Alkalinity as CaCO <sub>3</sub>	mg/L	[NT]	[NT]	[NR]	[NR]			
Carbonate Alkalinity as CaCO <sub>3</sub>	mg/L	[NT]	[NT]	[NR]	[NR]			
Total Alkalinity as CaCO <sub>3</sub>	mg/L	[NT]	[NT]	[NR]	[NR]			
Sulphate, SO <sub>4</sub>	mg/L	[NT]	[NT]	[NR]	[NR]			
Chloride, Cl	mg/L	[NT]	[NT]	[NR]	[NR]			
Ionic Balance	%	[NT]	[NT]	[NR]	[NR]			
QUALITYCONTROL	UNITS	Dup. Sm#	Duplicate	Spike Sm#	Spike % Recovery			
HM in water - dissolved			Base + Duplicate + %RPD					
Date prepared	-	[NT]	[NT]	100833-1	15/11/2013			
Date analysed	-	[NT]	[NT]	100833-1	15/11/2013			
Arsenic-Dissolved	µg/L	[NT]	[NT]	[NR]	[NR]			
Cadmium-Dissolved	µg/L	[NT]	[NT]	[NR]	[NR]			
Chromium-Dissolved	µg/L	[NT]	[NT]	[NR]	[NR]			
Copper-Dissolved	µg/L	[NT]	[NT]	[NR]	[NR]			
Lead-Dissolved	µg/L	[NT]	[NT]	[NR]	[NR]			
Mercury-Dissolved	µg/L	[NT]	[NT]	100833-1	96%			
Nickel-Dissolved	µg/L	[NT]	[NT]	[NR]	[NR]			
Zinc-Dissolved	µg/L	[NT]	[NT]	[NR]	[NR]			
Boron-Dissolved	µg/L	[NT]	[NT]	[NR]	[NR]			
Iron-Dissolved	µg/L	[NT]	[NT]	[NR]	[NR]			
Manganese-Dissolved	µg/L	[NT]	[NT]	[NR]	[NR]			
Selenium-Dissolved	µg/L	[NT]	[NT]	[NR]	[NR]			



**Report Comments:**

ION\_BALANCE: # Percent recovery is not possible to report due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

Asbestos ID was analysed by Approved Identifier: Not applicable for this job  
Asbestos ID was authorised by Approved Signatory: Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

**Quality Control Definitions**

**Blank:** This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

**Duplicate:** This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

**Matrix Spike:** A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

**LCS (Laboratory Control Sample):** This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

**Surrogate Spike:** Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

**Laboratory Acceptance Criteria**

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.



**CHAIN OF CUSTODY**

ALS Laboratory:  
please tick →

ADELAIDE 21 Burnie Road Pt Augusta SA 5095  
Ph: 08 8359 0090 E: adelaide@alsglobal.com  
BRISBANE 32 Shand Street Stafford QLD 4053  
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GLADSTONE 46 Callernah Road Clinton QLD 4680  
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MACKAY 75 Harbour Road Mackay QLD 4710  
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MUDJEE 27 Sydney Road Mudjee NSW 2850  
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PERTH 10 Hart Way Malaga WA 6060  
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SYDNEY 277-280 Woodlark Road Smithfield NSW 2164  
Ph: 02 8784 8555 E: samples.sydney@alsglobal.com  
TOWNSVILLE 14-15 Deema Court Bother QLD 4818  
Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com  
WOLLONGONG 09 Kenny Street Wollongong NSW 2509  
Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: ERM		TURNAROUND REQUIREMENTS : <input checked="" type="checkbox"/> Standard TAT (List due date):		FOR LABORATORY USE ONLY (COC)	
OFFICE: GROUND FLOOR, 33 SAUNDERS ST, PYRMONT NSW 2009		(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)		COC NO. [REDACTED]	
PROJECT: Wallerawang/Mt Piper GW		ALS QUOTE NO.: SY/278/13		COC SEQUENCE NUMBER (Circle)	
ORDER NUMBER: 0207423/0207420		Mt Piper		COC: 1 2 3 4 5 6 7	
PROJECT MANAGER: Jonathan Lekawski		CONTACT PH:		OF: 1 2 3 4 5 6 7	
SAMPLER: Dane Brookes/Skye Holloman		SAMPLER MOBILE: 0400918363		RECEIVED BY: Steven	
COC emailed to ALS? ( YES (NO) )		EDD FORMAT (or default): PDF/CSV/ESDAT		RECEIVED BY:	
Email Reports to (will default to PM if no other addresses are listed): Symphony.DeltaWest@erm.com		RELINQUISHED BY: [Signature]		RECEIVED BY:	
Email Invoice to (will default to PM if no other addresses are listed): Symphony.DeltaWest@erm.com		DATE/TIME: 11/11/13		DATE/TIME: 13/11/13 8:00	

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

			CONTAINER INFORMATION		ANALYSIS REQUIRED Including SUITES (NB. Suite codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).							Additional Information	
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below (refer to)	TOTAL CONTAINERS	W-4 (TPH/TRH) (C6-C36or 40)/BTEX/N	W2 - Dissolved Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg) - W-2	EG020F - Additional Metals - Se, B, Fe, Mn	UTO-5W Phenols and PAH - <del>phthalates</del>	VOC Scan	Cations - NT-1	Anions (incl F) - NT-2A	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.  Envirolab Services 12 Ashley St Chatswood NSW 2067 Ph: (02) 9910 6200  Job No: 100833  Date Received: 14/11 Time Received: 14:30 Received by: [Signature] Temp: Cool Ambient Cooling: Ice Pack Security: Intact/Broken/None  Please HWD to Secondary Lab Envirolab.
1	MH-X-D17	8/11/13	W	P, AG, N, H, VS	6	X	X	X	X	X	X	X	
2	MH-X-D19	8/11/13	↓	↓	6	X	X	X	X	X	X	X	
3	MG-X-4/D4	8/11/13	↓	↓	6	X	X	X	X	X	X	X	
4	D04-GW-08/11/13	8/11/13	↓	↓	6	X	X	X	X	X	X	X	
5	RB-GW7-06/11/13	6/11/13	↓	↓	6	X	X	X	X	X	X	X	
6	RB-GW9-08/11/13	8/11/13	↓	↓	6	X	X	X	X	X	X	X	
7	T01-GW-08/11/13	8/11/13	↓	↓	6	X	X	X	X	X	X	X	
7	TS	30/10/13	↓	VS	2	X	X	X	X	X	X	X	
8	TB	30/10/13	↓	VS	2	X	X	X	X	X	X	X	
TOTAL													

Subcon / Forward Lab / Split Wp  
 Lab / Analysis: T01-GW-08/11/13  
 Organised By / Date: [Signature]  
 Relinquished By / Date: [Signature]  
 Connote / Courier: [Signature]  
 Attach By / Internal Sheet: [Signature]

Environmental Division  
 Sydney  
 Work Order  
**ES1324556**

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved; A = Amber Glass; U = Unpreserved; AP = Airtight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulphuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulphuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation bottle; SP = Sulphuric Preserved; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

ERM  
 Sydney  
 Melbourne  
 Brisbane  
 Perth  
 Hunter Valley  
 North Coast  
 Other

Gird Floor, 33 Saunders Street, Pyrmont, NSW, 2009. (ph) 02 8584 8888 (fax) 02 8584 8800  
 Level 3, Yarra Tower, WTC, 18-38 Stideley Street, Docklands, VIC, 3005. (ph) 03 9696 8011 (fax) 03 9696 8022  
 Level 1, 60 Leichhardt Street, Spring Hill, QLD, 4004. (ph) 07 3839 8393 (fax) 07 3839 8381  
 Level 6, Grain Pool Bld, 172 St Georges Tce, WA, 6850. (ph) 08 9321 5200 (fax) 08 9321 5282  
 53 Bonville Avenue, Thornion, NSW, 2322. (ph) 02 4964 2150 (fax) 02 4964 2152  
 Suite 3/146 Gordon Street, Port Macquarie, NSW, 2444. (ph) 02 6584 7155 (fax) 02 6584 7160

Project No: 0207423  
 Project Name: Project Symphony - Mt Piper  
 Project Location: Mt Piper  
 Project Manager: Jonathan Lekawski  
 Sampler: Thavone Shaw

COC Number A 09787  
 Laboratory ALS

Laboratory Number	Sample ID	Sample Depth	Sample Date	Sample Time	Matrix Preservation			Containers (number/type)	Yes (tick)	BTEX	TPH (C6-C9 P & T) + Speciated TPH	VOC Scan (USEPA 8260 List)	SVOC Scan (USEPA 8270 List)	OC OP Pesticides	PAH	Phenols	PCB	Metals* (dissolved / total)	Other Comments on sample (eg: high voc, highly contaminated, special detection limits etc etc)
					Soil	Water	Other												
1	MA-MW07	10.12.13	11:20	11:20	X	X	X	6		X	X	X	X	X	X	X	X	X	
2	MA-MW07	10.12.13	11:20	11:20	X	X	X	5		X	X	X	X	X	X	X	X	X	no ferrous iron bottle.
3	ML-MW12	11	11:20	11:20	X	X	X	6		X	X	X	X	X	X	X	X	X	please forward to enviro lab.
4	MA-MW01	4.5	14:05	14:05	X	X	X	6		X	X	X	X	X	X	X	X	X	
5	MA-MW02	5.2	15:00	15:00	X	X	X	6		X	X	X	X	X	X	X	X	X	
6	MC-MW01	4.8	15:50	15:50	X	X	X	6		X	X	X	X	X	X	X	X	X	
7	MC-MW02	4.5	16:36	16:36	X	X	X	6		X	X	X	X	X	X	X	X	X	filtered water in plastic bottle for ferrous iron
8	TS(5)	-	-	-	X	X	X	1		X	X	X	X	X	X	X	X	X	
9	TB(2)	-	-	-	X	X	X	1		X	X	X	X	X	X	X	X	X	

Environmental Division  
 Sydney  
 Work Order  
**ES1327570**



Telephone : +61-2-8784 8555

Subcon / Forward Lab / Split WO  
 Lab / Analysis: EnviroLab / Tol-161213-TS  
 Organised By / Date:  
 Relinquished By / Date:  
 Comments / Courier:  
 WO No: ES1327570  
 Attach By PO / Internal Sheet

ENVIROLAB  
 12 Ashley St  
 Chatswood NSW 2067  
 Ph: (02) 9910 5200

Job No: 102901  
 Date Received: 9/12/13  
 Time Received: 15:40  
 Received by: [Signature]  
 Temp: Cool Ambient  
 Cooling: Icepack  
 Security: Intact Broken/None

General Analysis Requirements  
 1. Turn Around Time (please tick:  1 Day  2 Days  3 Days  Normal TAT)  
 2. Do you wish any sediment layers in water to be excluded from extractions?  
 3. Additional QAVOC reported where sample batches are < 10 samples?  
 4. % of extraneous material removed from samples to be reported as per NEPM 5.1.17

Comments: VOCs = including chlorinated hydrocarbons  
 Major cations + anions including sulfate + chloride.

Relinquished by: Thavone Shaw Signed: [Signature] Date/Time: 16.12.13 / 18:30  
 Received by: Steven Date/Time: 17/12/13 11:10

Relinquished by: [Signature] Date/Time: 17/12/13 11:10  
 Received by: Hiwake Date/Time: 19/12/13 15:20

**CERTIFICATE OF ANALYSIS**

**102901**

**Client:**

**Environmental Resources Management Australia**

Locked Bag 24

Broadway

NSW 2007

**Attention:** Jonathan Lekawksi

**Sample log in details:**

Your Reference:

**0207423, Symphony Mt Piper**

No. of samples:

1 water

Date samples received / completed instructions received

19/12/2013 / 19/12/2013

**Analysis Details:**

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

***Please refer to the last page of this report for any comments relating to the results.***

**Report Details:**

Date results requested by: / Issue Date:

8/01/14 / 6/01/14

Date of Preliminary Report:

Not issued

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Accredited for compliance with ISO/IEC 17025.

**Tests not covered by NATA are denoted with \*.**

**Results Approved By:**



---

Jacinta Hurst  
Laboratory Manager



VOCs in water Our Reference: Your Reference	UNITS -----	102901-1 T01_161213_ TS
Date Sampled Type of sample	-----	16/12/2013 water
Date extracted	-	20/12/2013
Date analysed	-	23/12/2013
Dichlorodifluoromethane	µg/L	<10
Chloromethane	µg/L	<10
Vinyl Chloride	µg/L	<10
Bromomethane	µg/L	<10
Chloroethane	µg/L	<10
Trichlorofluoromethane	µg/L	<10
1,1-Dichloroethene	µg/L	<1
Trans-1,2-dichloroethene	µg/L	<1
1,1-dichloroethane	µg/L	<1
Cis-1,2-dichloroethene	µg/L	<1
Bromochloromethane	µg/L	<1
Chloroform	µg/L	<1
2,2-dichloropropane	µg/L	<1
1,2-dichloroethane	µg/L	<1
1,1,1-trichloroethane	µg/L	<1
1,1-dichloropropene	µg/L	<1
Cyclohexane	µg/L	<1
Carbon tetrachloride	µg/L	<1
Benzene	µg/L	<1
Dibromomethane	µg/L	<1
1,2-dichloropropane	µg/L	<1
Trichloroethene	µg/L	<1
Bromodichloromethane	µg/L	<1
trans-1,3-dichloropropene	µg/L	<1
cis-1,3-dichloropropene	µg/L	<1
1,1,2-trichloroethane	µg/L	<1
Toluene	µg/L	<1
1,3-dichloropropane	µg/L	<1
Dibromochloromethane	µg/L	<1
1,2-dibromoethane	µg/L	<1
Tetrachloroethene	µg/L	<1
1,1,1,2-tetrachloroethane	µg/L	<1
Chlorobenzene	µg/L	<1
Ethylbenzene	µg/L	<1
Bromoform	µg/L	<1
m+p-xylene	µg/L	<2
Styrene	µg/L	<1
1,1,2,2-tetrachloroethane	µg/L	<1
o-xylene	µg/L	<1

VOCs in water Our Reference: Your Reference	UNITS -----	102901-1 T01_161213_ TS
Date Sampled Type of sample	-----	16/12/2013 water
1,2,3-trichloropropane	µg/L	<1
Isopropylbenzene	µg/L	<1
Bromobenzene	µg/L	<1
n-propyl benzene	µg/L	<1
2-chlorotoluene	µg/L	<1
4-chlorotoluene	µg/L	<1
1,3,5-trimethyl benzene	µg/L	<1
Tert-butyl benzene	µg/L	<1
1,2,4-trimethyl benzene	µg/L	<1
1,3-dichlorobenzene	µg/L	<1
Sec-butyl benzene	µg/L	<1
1,4-dichlorobenzene	µg/L	<1
4-isopropyl toluene	µg/L	<1
1,2-dichlorobenzene	µg/L	<1
n-butyl benzene	µg/L	<1
1,2-dibromo-3-chloropropane	µg/L	<1
1,2,4-trichlorobenzene	µg/L	<1
Hexachlorobutadiene	µg/L	<1
1,2,3-trichlorobenzene	µg/L	<1
Surrogate Dibromofluoromethane	%	117
Surrogate toluene-d8	%	97
Surrogate 4-BFB	%	86



vTRH(C6-C10)/BTEXN in Water		
Our Reference:	UNITS	102901-1
Your Reference	-----	T01_161213_
		TS
Date Sampled	-----	16/12/2013
Type of sample		water
Date extracted	-	20/12/2013
Date analysed	-	23/12/2013
TRHC <sub>6</sub> - C <sub>9</sub>	µg/L	<10
TRHC <sub>6</sub> - C <sub>10</sub>	µg/L	<10
TRHC <sub>6</sub> - C <sub>10</sub> less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	122
Surrogate toluene-d8	%	97
Surrogate 4-BFB	%	84

svTRH (C10-C40) in Water		
Our Reference:	UNITS	102901-1
Your Reference	-----	T01_161213_
		TS
Date Sampled	-----	16/12/2013
Type of sample		water
Date extracted	-	20/12/2013
Date analysed	-	20/12/2013
TRHC <sub>10</sub> - C <sub>14</sub>	µg/L	<50
TRHC <sub>15</sub> - C <sub>28</sub>	µg/L	<100
TRHC <sub>29</sub> - C <sub>36</sub>	µg/L	<100
TRH>C <sub>10</sub> - C <sub>16</sub>	µg/L	<50
TRH>C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	µg/L	<50
TRH>C <sub>16</sub> - C <sub>34</sub>	µg/L	<100
TRH>C <sub>34</sub> - C <sub>40</sub>	µg/L	<100
Surrogate o-Terphenyl	%	91

PAHs in Water Our Reference: Your Reference	UNITS -----	102901-1 T01_161213_ TS
Date Sampled Type of sample	-----	16/12/2013 water
Date extracted	-	20/12/2013
Date analysed	-	20/12/2013
Naphthalene	µg/L	<1
Acenaphthylene	µg/L	<1
Acenaphthene	µg/L	<1
Fluorene	µg/L	<1
Phenanthrene	µg/L	<1
Anthracene	µg/L	<1
Fluoranthene	µg/L	<1
Pyrene	µg/L	<1
Benzo(a)anthracene	µg/L	<1
Chrysene	µg/L	<1
Benzo(b+k)fluoranthene	µg/L	<2
Benzo(a)pyrene	µg/L	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1
Dibenzo(a,h)anthracene	µg/L	<1
Benzo(g,h,i)perylene	µg/L	<1
Benzo(a)pyrene TEQ	µg/L	<5
Total +ve PAH's	µg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	91

PCBs in Water		
Our Reference:	UNITS	102901-1
Your Reference	-----	T01_161213_
		TS
Date Sampled	-----	16/12/2013
Type of sample		water
Date extracted	-	20/12/2013
Date analysed	-	21/12/2013
Arochlor 1016	µg/L	<2
Arochlor 1221	µg/L	<2
Arochlor 1232	µg/L	<2
Arochlor 1242	µg/L	<2
Arochlor 1248	µg/L	<2
Arochlor 1254	µg/L	<2
Arochlor 1260	µg/L	<2
Surrogate TCLMX	%	81

Total Phenolics in Water		
Our Reference:	UNITS	102901-1
Your Reference	-----	T01_161213_
		TS
Date Sampled	-----	16/12/2013
Type of sample		water
Date extracted	-	20/12/2013
Date analysed	-	20/12/2013
Total Phenolics (as Phenol)	mg/L	<0.05

Ion Balance		
Our Reference:	UNITS	102901-1
Your Reference	-----	T01_161213_
		TS
Date Sampled	-----	16/12/2013
Type of sample		water
Date prepared	-	20/12/2013
Date analysed	-	20/12/2013
Calcium - Dissolved	mg/L	26
Potassium - Dissolved	mg/L	7.6
Sodium - Dissolved	mg/L	16
Magnesium - Dissolved	mg/L	26
Hydroxide Alkalinity (OH <sup>-</sup> ) as CaCO <sub>3</sub>	mg/L	<5
Bicarbonate Alkalinity as CaCO <sub>3</sub>	mg/L	50
Carbonate Alkalinity as CaCO <sub>3</sub>	mg/L	<5
Total Alkalinity as CaCO <sub>3</sub>	mg/L	50
Sulphate, SO <sub>4</sub>	mg/L	180
Chloride, Cl	mg/L	12
Ionic Balance	%	-8.3



HM in water - dissolved		
Our Reference:	UNITS	102901-1
Your Reference	-----	T01_161213_
		TS
Date Sampled	-----	16/12/2013
Type of sample		water
Date prepared	-	20/12/2013
Date analysed	-	20/12/2013
Arsenic-Dissolved	µg/L	<1
Cadmium-Dissolved	µg/L	<0.1
Chromium-Dissolved	µg/L	<1
Copper-Dissolved	µg/L	<1
Lead-Dissolved	µg/L	<1
Mercury-Dissolved	µg/L	<0.05
Nickel-Dissolved	µg/L	55
Zinc-Dissolved	µg/L	71
Boron-Dissolved	µg/L	30
Manganese-Dissolved	µg/L	1,700
Selenium-Dissolved	µg/L	<1

Miscellaneous Inorganics		
Our Reference:	UNITS	102901-1
Your Reference	-----	T01_161213_
		TS
Date Sampled	-----	16/12/2013
Type of sample		water
Date prepared	-	19/12/2013
Date analysed	-	20/12/2013
Fluoride, F	mg/L	<0.1
Ferrous Iron	mg/L	2.0

MethodID	Methodology Summary
Org-013	Water samples are analysed directly by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note Naphthalene is determined from the VOC analysis.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Inorg-030	Total Phenolics - determined colorimetrically following disitillation, based upon APHA 22nd ED 5530 D.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA 22nd ED, 2320-B.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA 22nd ED, 4110 -B.
Inorg-041	Gravimetric determination of the total solids content of water using APHA 22nd ED 2540B.
Metals-022 ICP-MS	Determination of various metals by ICP-MS.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-026	Fluoride determined by ion selective electrode (ISE) in accordance with APHA 22nd ED, 4500-F-C.
Inorg-076	A sample is determined colourimetrically by discrete analyser based on APHA 22nd ED 3500-Fe B.

Client Reference: 0207423, Symphony Mt Piper

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
VOCs in water						Base II Duplicate II %RPD		
Date extracted	-			20/12/2013	[NT]	[NT]	LCS-W1	20/12/2013
Date analysed	-			23/12/2013	[NT]	[NT]	LCS-W1	23/12/2013
Dichlorodifluoromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Chloromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Vinyl Chloride	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Bromomethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Chloroethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Trichlorofluoromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
1,1-Dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Trans-1,2-dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,1-dichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	102%
Cis-1,2-dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Bromochloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Chloroform	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	108%
2,2-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2-dichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	108%
1,1,1-trichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	113%
1,1-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Cyclohexane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Carbon tetrachloride	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Dibromomethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Trichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	112%
Bromodichloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	113%
trans-1,3-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
cis-1,3-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,1,2-trichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Toluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,3-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Dibromochloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	130%
1,2-dibromoethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Tetrachloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	109%
1,1,1,2-tetrachloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Chlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Ethylbenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Bromoform	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
m+p-xylene	µg/L	2	Org-013	<2	[NT]	[NT]	[NR]	[NR]
Styrene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,1,2,2-tetrachloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
o-xylene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]

Client Reference: 0207423, Symphony Mt Piper

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
VOCs in water						Base II Duplicate II %RPD		
1,2,3-trichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Isopropylbenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Bromobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
n-propyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
2-chlorotoluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
4-chlorotoluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,3,5-trimethyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Tert-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2,4-trimethyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,3-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Sec-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,4-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
4-isopropyl toluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
n-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2-dibromo-3-chloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2,4-trichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Hexachlorobutadiene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2,3-trichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Surrogate	%		Org-013	117	[NT]	[NT]	LCS-W1	109%
Dibromofluoromethane								
Surrogate toluene-d8	%		Org-013	98	[NT]	[NT]	LCS-W1	106%
Surrogate 4-BFB	%		Org-013	101	[NT]	[NT]	LCS-W1	102%

**Client Reference: 0207423, Symphony Mt Piper**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
vTRH(C6-C10)/BTEXN in Water						Base II Duplicate II %RPD		
Date extracted	-			20/12/2013	[NT]	[NT]	LCS-W1	20/12/2013
Date analysed	-			23/12/2013	[NT]	[NT]	LCS-W1	23/12/2013
TRHC <sub>6</sub> - C <sub>9</sub>	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W1	104%
TRHC <sub>6</sub> - C <sub>10</sub>	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W1	104%
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	99%
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	109%
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	102%
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	LCS-W1	105%
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	106%
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Surrogate Dibromofluoromethane	%		Org-016	117	[NT]	[NT]	LCS-W1	104%
Surrogate toluene-d8	%		Org-016	98	[NT]	[NT]	LCS-W1	102%
Surrogate 4-BFB	%		Org-016	101	[NT]	[NT]	LCS-W1	106%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
svTRH(C10-C40) in Water						Base II Duplicate II %RPD		
Date extracted	-			20/12/2013	[NT]	[NT]	LCS-W1	20/12/2013
Date analysed	-			20/12/2013	[NT]	[NT]	LCS-W1	20/12/2013
TRHC <sub>10</sub> - C <sub>14</sub>	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	84%
TRHC <sub>15</sub> - C <sub>28</sub>	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	100%
TRHC <sub>29</sub> - C <sub>36</sub>	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	121%
TRH>C <sub>10</sub> - C <sub>16</sub>	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	84%
TRH>C <sub>16</sub> - C <sub>34</sub>	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	100%
TRH>C <sub>34</sub> - C <sub>40</sub>	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	121%
Surrogate o-Terphenyl	%		Org-003	74	[NT]	[NT]	LCS-W1	112%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Water						Base II Duplicate II %RPD		
Date extracted	-			20/12/2013	[NT]	[NT]	LCS-W1	20/12/2013
Date analysed	-			20/12/2013	[NT]	[NT]	LCS-W1	20/12/2013
Naphthalene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	83%
Acenaphthylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluorene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	85%
Phenanthrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	82%



**Client Reference: 0207423, Symphony Mt Piper**

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Water						Base II Duplicate II %RPD		
Anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	81%
Pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	86%
Benzo(a)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Chrysene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	80%
Benzo(b+k)fluoranthene	µg/L	2	Org-012 subset	<2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	87%
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	88	[NT]	[NT]	LCS-W1	85%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PCBs in Water						Base II Duplicate II %RPD		
Date extracted	-			20/12/2013	[NT]	[NT]	LCS-W2	20/12/2013
Date analysed	-			21/12/2013	[NT]	[NT]	LCS-W2	21/12/2013
Arochlor 1016	µg/L	2	Org-006	<2	[NT]	[NT]	[NR]	[NR]
Arochlor 1221	µg/L	2	Org-006	<2	[NT]	[NT]	[NR]	[NR]
Arochlor 1232	µg/L	2	Org-006	<2	[NT]	[NT]	[NR]	[NR]
Arochlor 1242	µg/L	2	Org-006	<2	[NT]	[NT]	[NR]	[NR]
Arochlor 1248	µg/L	2	Org-006	<2	[NT]	[NT]	[NR]	[NR]
Arochlor 1254	µg/L	2	Org-006	<2	[NT]	[NT]	LCS-W2	96%
Arochlor 1260	µg/L	2	Org-006	<2	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%		Org-006	88	[NT]	[NT]	LCS-W2	80%

**Client Reference: 0207423, Symphony Mt Piper**

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Total Phenolics in Water						Base II Duplicate II %RPD		
Date extracted	-			20/12/2013	[NT]	[NT]	LCS-W1	20/12/2013
Date analysed	-			20/12/2013	[NT]	[NT]	LCS-W1	20/12/2013
Total Phenolics (as Phenol)	mg/L	0.05	Inorg-030	<0.05	[NT]	[NT]	LCS-W1	94%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Ion Balance						Base II Duplicate II %RPD		
Date prepared	-			24/12/2013	[NT]	[NT]	LCS-W1	20/12/2013
Date analysed	-			24/12/2013	[NT]	[NT]	LCS-W1	20/12/2013
Calcium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-W1	93%
Potassium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-W1	102%
Sodium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-W1	98%
Magnesium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-W1	94%
Hydroxide Alkalinity (OH <sup>-</sup> ) as CaCO <sub>3</sub>	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NR]	[NR]
Bicarbonate Alkalinity as CaCO <sub>3</sub>	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NR]	[NR]
Carbonate Alkalinity as CaCO <sub>3</sub>	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NR]	[NR]
Total Alkalinity as CaCO <sub>3</sub>	mg/L	5	Inorg-006	<5	[NT]	[NT]	LCS-W1	99%
Sulphate, SO <sub>4</sub>	mg/L	1	Inorg-081	<1	[NT]	[NT]	LCS-W1	120%
Chloride, Cl	mg/L	1	Inorg-081	<1	[NT]	[NT]	LCS-W1	107%
Ionic Balance	%		Inorg-041	[NT]	[NT]	[NT]	[NR]	[NR]

**Client Reference: 0207423, Symphony Mt Piper**

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
HM in water - dissolved						Base II Duplicate II %RPD		
Date prepared	-			20/12/2013	[NT]	[NT]	LCS-W1	20/12/2013
Date analysed	-			20/12/2013	[NT]	[NT]	LCS-W1	20/12/2013
Arsenic-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	102%
Cadmium-Dissolved	µg/L	0.1	Metals-022 ICP-MS	<0.1	[NT]	[NT]	LCS-W1	100%
Chromium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	99%
Copper-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	99%
Lead-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	101%
Mercury-Dissolved	µg/L	0.05	Metals-021 CV-AAS	<0.05	[NT]	[NT]	LCS-W1	100%
Nickel-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	103%
Zinc-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	98%
Boron-Dissolved	µg/L	5	Metals-022 ICP-MS	<5	[NT]	[NT]	LCS-W1	95%
Manganese-Dissolved	µg/L	5	Metals-022 ICP-MS	<5	[NT]	[NT]	LCS-W1	103%
Selenium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	95%

**Client Reference: 0207423, Symphony Mt Piper**

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Miscellaneous Inorganics						Base II Duplicate II %RPD		
Date prepared	-			24/12/2013	[NT]	[NT]	LCS-W1	19/12/2013
Date analysed	-			24/12/2013	[NT]	[NT]	LCS-W1	20/12/2013
Fluoride, F	mg/L	0.1	Inorg-026	<0.1	[NT]	[NT]	LCS-W1	99%
Ferrous Iron	mg/L	0.05	Inorg-076	<0.05	[NT]	[NT]	LCS-W1	118%

**Report Comments:**

Asbestos ID was analysed by Approved Identifier: Not applicable for this job  
 Asbestos ID was authorised by Approved Signatory: Not applicable for this job

INS: Insufficient sample for this test      PQL: Practical Quantitation Limit      NT: Not tested  
 NA: Test not required                      RPD: Relative Percent Difference      NA: Test not required  
 <: Less than                                  >: Greater than                              LCS: Laboratory Control Sample

**Quality Control Definitions**

**Blank:** This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

**Duplicate:** This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

**Matrix Spike :** A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

**LCS (Laboratory Control Sample) :** This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

**Surrogate Spike:** Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

**Laboratory Acceptance Criteria**

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.



# CHAIN OF CUSTODY

ALS Laboratory  
please tick →

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WALLINGTON 99 Kenny Street, Wallington, NSW, Australia  
Ph: 02 4275 3129 E: wallington@als.com

**CLIENT:** ERM

**OFFICE:** GROUND FLOOR, 33 SAUNDERS ST, PYRMONT NSW 2009

**PROJECT:** Symphony - Delta West

**ORDER NUMBER:** 0207420207423

**PROJECT MANAGER:** Jonathan Lektawski

**SAMPLER:** Chris Ford

**COC emailed to ALS? (YES / NO)**

**Email Reports to (will default to PM if no other addresses are listed):** Symphony.DeltaWest@erm.com

**Email Invoice to (will default to PM if no other addresses are listed):** Symphony.DeltaWest@erm.com

**COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:**

---

**TURNAROUND REQUIREMENTS:**  Standard TAT (List due date)  
(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)

**ALS QUOTE NO.:** SY1551115 V4

**CONTACT PH:** 8584 8888

**SAMPLER MOBILE:** 0424447671

**EDD FORMAT (or default):** ESDATIPDFXLS

**RECEIVED BY:** Steven

**DATE/TIME:** 17/12/13 11:10

**RELINQUISHED BY:** Chris Ford

**DATE/TIME:** 16/12/13

**COC SEQUENCE NUMBER (Circle)**

COC:	1	2	3	4	5	6	7
OF:	1	2	3	4	5	6	7

**FOR LABORATORY USE ONLY (Circle)**

Category	Yes	No
Field use (not for presentation)	Yes	No
Refrigeration (temperature of receipt)	Yes	No
Other	Yes	No

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (codes below)	TOTAL CONTAINERS (refer to)	ANALYSIS REQUIRED INCLUDING SUITES (NB, Suite Codes must be listed to attract full price) Where Metals are required, specify Total (unfiltered bottles required) or Dissolved (field filtered bottle required).										Additional Information				
						W4 (TPHTRH) (C6)	8 Ultra Trace Dissolved Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg)	Ultra Trace - Se, Po, Tl, Mn	Ferrous Iron	PAH/Phenols	VOC Scan	PCB	Cations/Anions							
1	MF_MW04	1708 16.12.13	W		6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
2	MH_MW02	1523 16.12.13	W		6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
3	MF_MW05	1112 16.12.13	W		6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
4	DD1-161213CF	- 16.12.13	W		6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
5	DD1-161213CF	- 16.12.13	W		6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
6	TS	16.12.13	W		4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		PLS FWO TO ENVIROLAB			
7	TB	11	W		4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
					Envirolab Services 12 Ashby St Chatswood NSW 2067 Ph: (02) 9976 6200		Job No: 102403		Date Received: 19/12/13		Time Received: 15:40		Received by: Hm		Temp: Cool/Ambient		Cooling: Ice/NoCool		Security: Intact/Broken/None	
					TOTAL CONTAINERS		30													



Environmental Division  
Sydney  
Work Order  
**ES1327569**

Telephone : + 61-2-8784 8555

**Water Container Codes:** P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORG = Nitric Preserved ORC; SH = Sodium Hydroxide Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic  
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial; SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation bottle; SP = Sulfuric Pres  
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Solts; B = Unpreserved Bag



**CERTIFICATE OF ANALYSIS**

**102903**

**Client:**

**Environmental Resources Management Australia**

Locked Bag 24

Broadway

NSW 2007

**Attention:** Jonathan Lekawksi

**Sample log in details:**

Your Reference:	<b>0207420, Symphony Delta West</b>
No. of samples:	1 water
Date samples received / completed instructions received	19/12/2013 / 19/12/2013

**Analysis Details:**

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

***Please refer to the last page of this report for any comments relating to the results.***

**Report Details:**

Date results requested by: / Issue Date: 8/01/14 / 6/01/14

Date of Preliminary Report: Not issued

NATA accreditation number 2901. This document shall not be reproduced except in full.

Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with \*.**

**Results Approved By:**



---

Jacinta Hurst  
Laboratory Manager

vTRH(C6-C10)/BTEXN in Water		
Our Reference:	UNITS	102903-1
Your Reference	-----	T01_161213C F
Date Sampled	-----	16/12/2013
Type of sample		water
Date extracted	-	20/12/2013
Date analysed	-	22/12/2013
TRHC <sub>6</sub> - C <sub>9</sub>	µg/L	<10
TRHC <sub>6</sub> - C <sub>10</sub>	µg/L	<10
TRHC <sub>6</sub> - C <sub>10</sub> less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	96
Surrogate toluene-d8	%	94
Surrogate 4-BFB	%	84

svTRH (C10-C40) in Water		
Our Reference:	UNITS	102903-1
Your Reference	-----	T01_161213C F
Date Sampled	-----	16/12/2013
Type of sample		water
Date extracted	-	20/12/2013
Date analysed	-	20/12/2013
TRHC <sub>10</sub> - C <sub>14</sub>	µg/L	<50
TRHC <sub>15</sub> - C <sub>28</sub>	µg/L	<100
TRHC <sub>29</sub> - C <sub>36</sub>	µg/L	<100
TRH>C <sub>10</sub> - C <sub>16</sub>	µg/L	<50
TRH>C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	µg/L	<50
TRH>C <sub>16</sub> - C <sub>34</sub>	µg/L	<100
TRH>C <sub>34</sub> - C <sub>40</sub>	µg/L	<100
Surrogate o-Terphenyl	%	93

PAHs in Water Our Reference: Your Reference	UNITS -----	102903-1 T01_161213C F
Date Sampled Type of sample	-----	16/12/2013 water
Date extracted	-	20/12/2013
Date analysed	-	21/12/2013
Naphthalene	µg/L	<1
Acenaphthylene	µg/L	<1
Acenaphthene	µg/L	<1
Fluorene	µg/L	<1
Phenanthrene	µg/L	<1
Anthracene	µg/L	<1
Fluoranthene	µg/L	<1
Pyrene	µg/L	<1
Benzo(a)anthracene	µg/L	<1
Chrysene	µg/L	<1
Benzo(b+k)fluoranthene	µg/L	<2
Benzo(a)pyrene	µg/L	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1
Dibenzo(a,h)anthracene	µg/L	<1
Benzo(g,h,i)perylene	µg/L	<1
Benzo(a)pyrene TEQ	µg/L	<5
Total +ve PAH's	µg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	85

Total Phenolics in Water		
Our Reference:	UNITS	102903-1
Your Reference	-----	T01_161213C F
Date Sampled	-----	16/12/2013
Type of sample		water
Date extracted	-	19/12/2013
Date analysed	-	19/12/2013
Total Phenolics (as Phenol)	mg/L	<0.05

Ion Balance		
Our Reference:	UNITS	102903-1
Your Reference	-----	T01_161213C F
Date Sampled	-----	16/12/2013
Type of sample		water
Date prepared	-	20/12/2013
Date analysed	-	20/12/2013
Calcium - Dissolved	mg/L	19
Potassium - Dissolved	mg/L	7.9
Sodium - Dissolved	mg/L	12
Magnesium - Dissolved	mg/L	9.1
Hydroxide Alkalinity (OH <sup>-</sup> ) as CaCO <sub>3</sub>	mg/L	<5
Bicarbonate Alkalinity as CaCO <sub>3</sub>	mg/L	100
Carbonate Alkalinity as CaCO <sub>3</sub>	mg/L	<5
Total Alkalinity as CaCO <sub>3</sub>	mg/L	100
Sulphate, SO <sub>4</sub>	mg/L	20
Chloride, Cl	mg/L	10
Ionic Balance	%	-6.3



HM in water - dissolved		
Our Reference:	UNITS	102903-1
Your Reference	-----	T01_161213C F
Date Sampled	-----	16/12/2013
Type of sample		water
Date prepared	-	20/12/2013
Date analysed	-	20/12/2013
Arsenic-Dissolved	µg/L	2
Cadmium-Dissolved	µg/L	0.1
Chromium-Dissolved	µg/L	<1
Copper-Dissolved	µg/L	<1
Lead-Dissolved	µg/L	<1
Mercury-Dissolved	µg/L	<0.05
Nickel-Dissolved	µg/L	17
Zinc-Dissolved	µg/L	43
Boron-Dissolved	µg/L	33
Manganese-Dissolved	µg/L	1,700
Selenium-Dissolved	µg/L	<1

Miscellaneous Inorganics		
Our Reference:	UNITS	102903-1
Your Reference	-----	T01_161213C F
Date Sampled	-----	16/12/2013
Type of sample		water
Date prepared	-	20/12/2013
Date analysed	-	20/12/2013
Ferrous Iron	mg/L	2.5
Fluoride, F	mg/L	<0.1

MethodID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-013	Water samples are analysed directly by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note Naphthalene is determined from the VOC analysis.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Inorg-030	Total Phenolics - determined colorimetrically following disitillation, based upon APHA 22nd ED 5530 D.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA 22nd ED, 2320-B.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA 22nd ED, 4110 -B.
Inorg-041	Gravimetric determination of the total solids content of water using APHA 22nd ED 2540B.
Metals-022 ICP-MS	Determination of various metals by ICP-MS.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-076	A sample is determined colourimetrically by discrete analyser based on APHA 22nd ED 3500-Fe B.
Inorg-026	Fluoride determined by ion selective electrode (ISE) in accordance with APHA 22nd ED, 4500-F-C.

Client Reference: 0207420, Symphony Delta West

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
vTRH(C6-C10)/BTEXN in Water						Base II Duplicate II %RPD		
Date extracted	-			20/12/2013	[NT]	[NT]	LCS-W1	20/12/2013
Date analysed	-			22/12/2013	[NT]	[NT]	LCS-W1	22/12/2013
TRHC <sub>6</sub> - C <sub>9</sub>	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W1	96%
TRHC <sub>6</sub> - C <sub>10</sub>	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W1	96%
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	101%
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	93%
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	93%
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	LCS-W1	97%
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	95%
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Surrogate Dibromofluoromethane	%		Org-016	108	[NT]	[NT]	LCS-W1	107%
Surrogate toluene-d8	%		Org-016	94	[NT]	[NT]	LCS-W1	103%
Surrogate 4-BFB	%		Org-016	86	[NT]	[NT]	LCS-W1	99%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
svTRH(C10-C40) in Water						Base II Duplicate II %RPD		
Date extracted	-			20/12/2013	[NT]	[NT]	LCS-W2	20/12/2013
Date analysed	-			20/12/2013	[NT]	[NT]	LCS-W2	20/12/2013
TRHC <sub>10</sub> - C <sub>14</sub>	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W2	85%
TRHC <sub>15</sub> - C <sub>28</sub>	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W2	98%
TRHC <sub>29</sub> - C <sub>36</sub>	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W2	84%
TRH>C <sub>10</sub> - C <sub>16</sub>	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W2	85%
TRH>C <sub>16</sub> - C <sub>34</sub>	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W2	98%
TRH>C <sub>34</sub> - C <sub>40</sub>	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W2	84%
Surrogate o-Terphenyl	%		Org-003	89	[NT]	[NT]	LCS-W2	108%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Water						Base II Duplicate II %RPD		
Date extracted	-			20/12/2013	[NT]	[NT]	LCS-W2	20/12/2013
Date analysed	-			21/12/2013	[NT]	[NT]	LCS-W2	21/12/2013
Naphthalene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W2	85%
Acenaphthylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluorene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W2	92%
Phenanthrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W2	88%

**Client Reference: 0207420, Symphony Delta West**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Water						Base II Duplicate II %RPD		
Anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W2	88%
Pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W2	93%
Benzo(a)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Chrysene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W2	86%
Benzo(b+k)fluoranthene	µg/L	2	Org-012 subset	<2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W2	89%
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	97	[NT]	[NT]	LCS-W2	84%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Total Phenolics in Water						Base II Duplicate II %RPD		
Date extracted	-			19/12/2013	[NT]	[NT]	LCS-W1	19/12/2013
Date analysed	-			19/12/2013	[NT]	[NT]	LCS-W1	19/12/2013
Total Phenolics (as Phenol)	mg/L	0.05	Inorg-030	<0.05	[NT]	[NT]	LCS-W1	92%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Ion Balance						Base II Duplicate II %RPD		
Date prepared	-			19/12/2013	[NT]	[NT]	LCS-W1	20/12/2013
Date analysed	-			19/12/2013	[NT]	[NT]	LCS-W1	20/12/2013
Calcium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-W1	93%
Potassium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-W1	102%
Sodium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-W1	98%
Magnesium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-W1	94%
Hydroxide Alkalinity (OH <sup>-</sup> ) as CaCO <sub>3</sub>	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NR]	[NR]
Bicarbonate Alkalinity as CaCO <sub>3</sub>	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NR]	[NR]
Carbonate Alkalinity as CaCO <sub>3</sub>	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NR]	[NR]

**Client Reference: 0207420, Symphony Delta West**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Ion Balance						Base II Duplicate II %RPD		
Total Alkalinity as CaCO <sub>3</sub>	mg/L	5	Inorg-006	<5	[NT]	[NT]	LCS-W1	100%
Sulphate, SO <sub>4</sub>	mg/L	1	Inorg-081	<1	[NT]	[NT]	LCS-W1	120%
Chloride, Cl	mg/L	1	Inorg-081	<1	[NT]	[NT]	LCS-W1	107%
Ionic Balance	%		Inorg-041	[NT]	[NT]	[NT]	[NR]	[NR]
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
HM in water - dissolved						Base II Duplicate II %RPD		
Date prepared	-			20/12/2013	[NT]	[NT]	LCS-W1	20/12/2013
Date analysed	-			20/12/2013	[NT]	[NT]	LCS-W1	20/12/2013
Arsenic-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	102%
Cadmium-Dissolved	µg/L	0.1	Metals-022 ICP-MS	<0.1	[NT]	[NT]	LCS-W1	100%
Chromium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	99%
Copper-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	99%
Lead-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	101%
Mercury-Dissolved	µg/L	0.05	Metals-021 CV-AAS	<0.05	[NT]	[NT]	LCS-W1	100%
Nickel-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	103%
Zinc-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	98%
Boron-Dissolved	µg/L	5	Metals-022 ICP-MS	<5	[NT]	[NT]	LCS-W1	95%
Manganese-Dissolved	µg/L	5	Metals-022 ICP-MS	<5	[NT]	[NT]	LCS-W1	103%
Selenium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	95%



**Client Reference: 0207420, Symphony Delta West**

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Miscellaneous Inorganics						Base II Duplicate II %RPD		
Date prepared	-			20/12/2013	[NT]	[NT]	LCS-W1	20/12/2013
Date analysed	-			20/12/2013	[NT]	[NT]	LCS-W1	20/12/2013
Ferrous Iron	mg/L	0.05	Inorg-076	<0.05	[NT]	[NT]	LCS-W1	118%
Fluoride, F	mg/L	0.1	Inorg-026	<0.1	[NT]	[NT]	LCS-W1	99%

**Report Comments:**

Asbestos ID was analysed by Approved Identifier: Not applicable for this job  
 Asbestos ID was authorised by Approved Signatory: Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

**Quality Control Definitions**

**Blank:** This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

**Duplicate:** This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

**Matrix Spike :** A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

**LCS (Laboratory Control Sample) :** This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

**Surrogate Spike:** Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

**Laboratory Acceptance Criteria**

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.



**CERTIFICATE OF ANALYSIS**

**103024**

**Client:**

**Environmental Resources Management Australia**

Locked Bag 24

Broadway

NSW 2007

**Attention:** Jonathan Lekawksi

**Sample log in details:**

Your Reference:

**0207423, Symphony Mt Piper**

No. of samples:

2 waters

Date samples received / completed instructions received

23/12/2013 / 23/12/2013

**Analysis Details:**

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

***Please refer to the last page of this report for any comments relating to the results.***

**Report Details:**

Date results requested by: / Issue Date:

8/01/14 / 7/01/14

Date of Preliminary Report:

Not issued

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Accredited for compliance with ISO/IEC 17025.

**Tests not covered by NATA are denoted with \*.**

**Results Approved By:**



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Jacinta Hurst  
Laboratory Manager

VOCs in water Our Reference: Your Reference	UNITS -----	103024-1 T01_171213_ TS
Date Sampled Type of sample	-----	17/12/2013 water
Date extracted	-	23/12/2013
Date analysed	-	28/12/2013
Dichlorodifluoromethane	µg/L	<10
Chloromethane	µg/L	<10
Vinyl Chloride	µg/L	<10
Bromomethane	µg/L	<10
Chloroethane	µg/L	<10
Trichlorofluoromethane	µg/L	<10
1,1-Dichloroethene	µg/L	<1
Trans-1,2-dichloroethene	µg/L	<1
1,1-dichloroethane	µg/L	<1
Cis-1,2-dichloroethene	µg/L	<1
Bromochloromethane	µg/L	<1
Chloroform	µg/L	<1
2,2-dichloropropane	µg/L	<1
1,2-dichloroethane	µg/L	<1
1,1,1-trichloroethane	µg/L	<1
1,1-dichloropropene	µg/L	<1
Cyclohexane	µg/L	<1
Carbon tetrachloride	µg/L	<1
Benzene	µg/L	<1
Dibromomethane	µg/L	<1
1,2-dichloropropane	µg/L	<1
Trichloroethene	µg/L	<1
Bromodichloromethane	µg/L	<1
trans-1,3-dichloropropene	µg/L	<1
cis-1,3-dichloropropene	µg/L	<1
1,1,2-trichloroethane	µg/L	<1
Toluene	µg/L	<1
1,3-dichloropropane	µg/L	<1
Dibromochloromethane	µg/L	<1
1,2-dibromoethane	µg/L	<1
Tetrachloroethene	µg/L	<1
1,1,1,2-tetrachloroethane	µg/L	<1
Chlorobenzene	µg/L	<1
Ethylbenzene	µg/L	<1
Bromoform	µg/L	<1
m+p-xylene	µg/L	<2
Styrene	µg/L	<1
1,1,2,2-tetrachloroethane	µg/L	<1
o-xylene	µg/L	<1

VOCs in water Our Reference: Your Reference	UNITS -----	103024-1 T01_171213_ TS
Date Sampled Type of sample	-----	17/12/2013 water
1,2,3-trichloropropane	µg/L	<1
Isopropylbenzene	µg/L	<1
Bromobenzene	µg/L	<1
n-propyl benzene	µg/L	<1
2-chlorotoluene	µg/L	<1
4-chlorotoluene	µg/L	<1
1,3,5-trimethyl benzene	µg/L	<1
Tert-butyl benzene	µg/L	<1
1,2,4-trimethyl benzene	µg/L	<1
1,3-dichlorobenzene	µg/L	<1
Sec-butyl benzene	µg/L	<1
1,4-dichlorobenzene	µg/L	<1
4-isopropyl toluene	µg/L	<1
1,2-dichlorobenzene	µg/L	<1
n-butyl benzene	µg/L	<1
1,2-dibromo-3-chloropropane	µg/L	<1
1,2,4-trichlorobenzene	µg/L	<1
Hexachlorobutadiene	µg/L	<1
1,2,3-trichlorobenzene	µg/L	<1
Surrogate Dibromofluoromethane	%	127
Surrogate toluene-d8	%	96
Surrogate 4-BFB	%	77



vTRH(C6-C10)/BTEXN in Water	UNITS	103024-1	103024-2
Our Reference:	-----	T01_171213_	T01_171213_
Your Reference		TS	CF
Date Sampled	-----	17/12/2013	17/12/2013
Type of sample		water	water
Date extracted	-	24/12/2013	24/12/2013
Date analysed	-	25/12/2013	25/12/2013
TRHC <sub>6</sub> - C <sub>9</sub>	µg/L	<10	<10
TRHC <sub>6</sub> - C <sub>10</sub>	µg/L	<10	<10
TRHC <sub>6</sub> - C <sub>10</sub> less BTEX (F1)	µg/L	<10	<10
Benzene	µg/L	<1	<1
Toluene	µg/L	<1	<1
Ethylbenzene	µg/L	<1	<1
m+p-xylene	µg/L	<2	<2
o-xylene	µg/L	<1	<1
Naphthalene	µg/L	<1	<1
Surrogate Dibromofluoromethane	%	126	108
Surrogate toluene-d8	%	97	101
Surrogate 4-BFB	%	77	86

svTRH (C10-C40) in Water Our Reference: Your Reference	UNITS -----	103024-1 T01_171213_ TS	103024-2 T01_171213_ CF
Date Sampled	-----	17/12/2013	17/12/2013
Type of sample		water	water
Date extracted	-	24/12/2013	24/12/2013
Date analysed	-	24/12/2013	24/12/2013
TRHC <sub>10</sub> - C <sub>14</sub>	µg/L	<50	<50
TRHC <sub>15</sub> - C <sub>28</sub>	µg/L	<100	<100
TRHC <sub>29</sub> - C <sub>36</sub>	µg/L	<100	<100
TRH>C <sub>10</sub> - C <sub>16</sub>	µg/L	<50	<50
TRH>C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	µg/L	<50	<50
TRH>C <sub>16</sub> - C <sub>34</sub>	µg/L	<100	<100
TRH>C <sub>34</sub> - C <sub>40</sub>	µg/L	<100	<100
Surrogate o-Terphenyl	%	90	95

PAHs in Water Our Reference: Your Reference	UNITS -----	103024-1 T01_171213_ TS	103024-2 T01_171213_ CF
Date Sampled	-----	17/12/2013	17/12/2013
Type of sample		water	water
Date extracted	-	24/12/2013	24/12/2013
Date analysed	-	24/12/2013	24/12/2013
Naphthalene	µg/L	<1	<1
Acenaphthylene	µg/L	<1	<1
Acenaphthene	µg/L	<1	<1
Fluorene	µg/L	<1	<1
Phenanthrene	µg/L	<1	<1
Anthracene	µg/L	<1	<1
Fluoranthene	µg/L	<1	<1
Pyrene	µg/L	<1	<1
Benzo(a)anthracene	µg/L	<1	<1
Chrysene	µg/L	<1	<1
Benzo(b+k)fluoranthene	µg/L	<2	<2
Benzo(a)pyrene	µg/L	<1	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1	<1
Dibenzo(a,h)anthracene	µg/L	<1	<1
Benzo(g,h,i)perylene	µg/L	<1	<1
Benzo(a)pyrene TEQ	µg/L	<5	<5
Total +ve PAH's	µg/L	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	104	114

Total Phenolics in Water			
Our Reference:	UNITS	103024-1	103024-2
Your Reference	-----	T01_171213_	T01_171213_
		TS	CF
Date Sampled	-----	17/12/2013	17/12/2013
Type of sample		water	water
Date extracted	-	06/01/2014	06/01/2014
Date analysed	-	06/01/2014	06/01/2014
Total Phenolics (as Phenol)	mg/L	<0.05	<0.05

Ion Balance Our Reference: Your Reference	UNITS -----	103024-1 T01_171213_ TS	103024-2 T01_171213_ CF
Date Sampled	-----	17/12/2013	17/12/2013
Type of sample		water	water
Date prepared	-	24/12/2013	24/12/2013
Date analysed	-	24/12/2013	24/12/2013
Calcium - Dissolved	mg/L	19	160
Potassium - Dissolved	mg/L	4.5	26
Sodium - Dissolved	mg/L	190	220
Magnesium - Dissolved	mg/L	6.7	98
Hydroxide Alkalinity (OH <sup>-</sup> ) as CaCO <sub>3</sub>	mg/L	<5	<5
Bicarbonate Alkalinity as CaCO <sub>3</sub>	mg/L	17	120
Carbonate Alkalinity as CaCO <sub>3</sub>	mg/L	<5	<5
Total Alkalinity as CaCO <sub>3</sub>	mg/L	17	120
Sulphate, SO <sub>4</sub>	mg/L	260	1,100
Chloride, Cl	mg/L	140	61
Ionic Balance	%	2.4	1.1

HM in water - dissolved	UNITS	103024-1	103024-2
Our Reference:	-----	T01_171213_	T01_171213_
Your Reference		TS	CF
Date Sampled	-----	17/12/2013	17/12/2013
Type of sample		water	water
Date prepared	-	24/12/2013	24/12/2013
Date analysed	-	24/12/2013	24/12/2013
Arsenic-Dissolved	µg/L	4	<1
Cadmium-Dissolved	µg/L	0.1	0.6
Chromium-Dissolved	µg/L	3	<1
Copper-Dissolved	µg/L	1	2
Lead-Dissolved	µg/L	19	<1
Mercury-Dissolved	µg/L	<0.05	<0.05
Nickel-Dissolved	µg/L	35	300
Zinc-Dissolved	µg/L	76	290



MethodID	Methodology Summary
Org-013	Water samples are analysed directly by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note Naphthalene is determined from the VOC analysis.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Inorg-030	Total Phenolics - determined colorimetrically following disitillation, based upon APHA 22nd ED 5530 D.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA 22nd ED, 2320-B.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA 22nd ED, 4110 -B.
Inorg-041	Gravimetric determination of the total solids content of water using APHA 22nd ED 2540B.
Metals-022 ICP-MS	Determination of various metals by ICP-MS.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.

Client Reference: 0207423, Symphony Mt Piper

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
VOCs in water						Base II Duplicate II %RPD		
Date extracted	-			[NT]	[NT]	[NT]	LCS-W1	23/12/2013
Date analysed	-			[NT]	[NT]	[NT]	LCS-W1	28/12/2013
Dichlorodifluoromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Chloromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Vinyl Chloride	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Bromomethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Chloroethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Trichlorofluoromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
1,1-Dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Trans-1,2-dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,1-dichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	110%
Cis-1,2-dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Bromochloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Chloroform	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	108%
2,2-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2-dichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	104%
1,1,1-trichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	105%
1,1-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Cyclohexane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Carbon tetrachloride	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Dibromomethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Trichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	115%
Bromodichloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	102%
trans-1,3-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
cis-1,3-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,1,2-trichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Toluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,3-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Dibromochloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	102%
1,2-dibromoethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Tetrachloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-W1	101%
1,1,1,2-tetrachloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Chlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Ethylbenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Bromoform	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
m+p-xylene	µg/L	2	Org-013	<2	[NT]	[NT]	[NR]	[NR]
Styrene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,1,2,2-tetrachloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
o-xylene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2,3-trichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]

Client Reference: 0207423, Symphony Mt Piper

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
VOCs in water						Base II Duplicate II %RPD		
Isopropylbenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Bromobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
n-propyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
2-chlorotoluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
4-chlorotoluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,3,5-trimethyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Tert-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2,4-trimethyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,3-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Sec-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,4-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
4-isopropyl toluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
n-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2-dibromo-3-chloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2,4-trichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Hexachlorobutadiene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2,3-trichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Surrogate	%		Org-013	[NT]	[NT]	[NT]	LCS-W1	97%
Dibromofluoromethane								
Surrogate toluene-d8	%		Org-013	[NT]	[NT]	[NT]	LCS-W1	104%
Surrogate 4-BFB	%		Org-013	[NT]	[NT]	[NT]	LCS-W1	98%

**Client Reference: 0207423, Symphony Mt Piper**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
vTRH(C6-C10)/BTEXN in Water						Base II Duplicate II %RPD		
Date extracted	-			24/12/2013	[NT]	[NT]	LCS-W2	24/12/2013
Date analysed	-			25/12/2013	[NT]	[NT]	LCS-W2	25/12/2013
TRHC <sub>6</sub> - C <sub>9</sub>	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W2	92%
TRHC <sub>6</sub> - C <sub>10</sub>	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W2	92%
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W2	95%
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W2	95%
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W2	89%
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	LCS-W2	90%
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W2	89%
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Surrogate Dibromofluoromethane	%		Org-016	102	[NT]	[NT]	LCS-W2	104%
Surrogate toluene-d8	%		Org-016	103	[NT]	[NT]	LCS-W2	105%
Surrogate 4-BFB	%		Org-016	82	[NT]	[NT]	LCS-W2	98%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
svTRH(C10-C40) in Water						Base II Duplicate II %RPD		
Date extracted	-			24/12/2013	[NT]	[NT]	LCS-W1	24/12/2013
Date analysed	-			24/12/2013	[NT]	[NT]	LCS-W1	24/12/2013
TRHC <sub>10</sub> - C <sub>14</sub>	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	82%
TRHC <sub>15</sub> - C <sub>28</sub>	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	95%
TRHC <sub>29</sub> - C <sub>36</sub>	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	88%
TRH>C <sub>10</sub> - C <sub>16</sub>	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	82%
TRH>C <sub>16</sub> - C <sub>34</sub>	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	95%
TRH>C <sub>34</sub> - C <sub>40</sub>	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	88%
Surrogate o-Terphenyl	%		Org-003	91	[NT]	[NT]	LCS-W1	99%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Water						Base II Duplicate II %RPD		
Date extracted	-			24/12/2013	[NT]	[NT]	LCS-W1	24/12/2013
Date analysed	-			24/12/2013	[NT]	[NT]	LCS-W1	24/12/2013
Naphthalene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	96%
Acenaphthylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluorene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	93%
Phenanthrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	92%

**Client Reference: 0207423, Symphony Mt Piper**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Water						Base II Duplicate II %RPD		
Anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	95%
Pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	99%
Benzo(a)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Chrysene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	80%
Benzo(b+k)fluoranthene	µg/L	2	Org-012 subset	<2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	92%
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	94	[NT]	[NT]	LCS-W1	103%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Total Phenolics in Water						Base II Duplicate II %RPD		
Date extracted	-			06/01/2014	[NT]	[NT]	LCS-W1	06/01/2014
Date analysed	-			06/01/2014	[NT]	[NT]	LCS-W1	06/01/2014
Total Phenolics (as Phenol)	mg/L	0.05	Inorg-030	<0.05	[NT]	[NT]	LCS-W1	94%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Ion Balance						Base II Duplicate II %RPD		
Date prepared	-			24/12/2013	[NT]	[NT]	LCS-W1	24/12/2013
Date analysed	-			24/12/2013	[NT]	[NT]	LCS-W1	24/12/2013
Calcium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-W1	106%
Potassium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-W1	118%
Sodium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-W1	100%
Magnesium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-W1	104%
Hydroxide Alkalinity (OH <sup>-</sup> ) as CaCO <sub>3</sub>	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NR]	[NR]
Bicarbonate Alkalinity as CaCO <sub>3</sub>	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NR]	[NR]
Carbonate Alkalinity as CaCO <sub>3</sub>	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NR]	[NR]

**Client Reference: 0207423, Symphony Mt Piper**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Ion Balance						Base II Duplicate II %RPD		
Total Alkalinity as CaCO <sub>3</sub>	mg/L	5	Inorg-006	<5	[NT]	[NT]	LCS-W1	106%
Sulphate, SO <sub>4</sub>	mg/L	1	Inorg-081	<1	[NT]	[NT]	LCS-W1	119%
Chloride, Cl	mg/L	1	Inorg-081	<1	[NT]	[NT]	LCS-W1	107%
Ionic Balance	%		Inorg-041	[NT]	[NT]	[NT]	[NR]	[NR]
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
HM in water - dissolved						Base II Duplicate II %RPD		
Date prepared	-			24/12/2013	[NT]	[NT]	LCS-W1	24/12/2013
Date analysed	-			24/12/2013	[NT]	[NT]	LCS-W1	24/12/2013
Arsenic-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	82%
Cadmium-Dissolved	µg/L	0.1	Metals-022 ICP-MS	<0.1	[NT]	[NT]	LCS-W1	92%
Chromium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	95%
Copper-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	93%
Lead-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	104%
Mercury-Dissolved	µg/L	0.05	Metals-021 CV-AAS	<0.05	[NT]	[NT]	LCS-W1	96%
Nickel-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	98%
Zinc-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W1	80%



**Report Comments:**

Asbestos ID was analysed by Approved Identifier: Not applicable for this job  
 Asbestos ID was authorised by Approved Signatory: Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

**Quality Control Definitions**

**Blank:** This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

**Duplicate:** This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

**Matrix Spike :** A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

**LCS (Laboratory Control Sample) :** This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

**Surrogate Spike:** Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

**Laboratory Acceptance Criteria**

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>ES1321739</b> <b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : MR JONATHAN LEKAWSKI <b>Address</b> : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007  <b>E-mail</b> : jonathan.lekawski@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800 <b>Project</b> : 0207423 MT PIPER (SYMPHONY) STAGE 2 <b>Order number</b> : ---- <b>C-O-C number</b> : 13214 <b>Sampler</b> : GAVIN POWELL <b>Site</b> : MT. PIPER  <b>Quote number</b> : SY/551/13 V4	<b>Page</b> : 1 of 9  <b>Laboratory</b> : Environmental Division Sydney <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164  <b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555 <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement  <b>Date Samples Received</b> : 04-OCT-2013 <b>Issue Date</b> : 11-OCT-2013  <b>No. of samples received</b> : 3 <b>No. of samples analysed</b> : 3
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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Organics



### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MWMP_01	MWMP_02	MWMP_03	----	----
				03-OCT-2013 15:00	03-OCT-2013 15:00	03-OCT-2013 15:00	----	----
Compound	CAS Number	LOR	Unit	ES1321739-001	ES1321739-002	ES1321739-003	----	----
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	50	74	78	----	----
Total Alkalinity as CaCO3	----	1	mg/L	50	74	78	----	----
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	26	49	4	----	----
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	7	13	9	----	----
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	2	10	9	----	----
Magnesium	7439-95-4	1	mg/L	1	5	6	----	----
Sodium	7440-23-5	1	mg/L	26	31	15	----	----
Potassium	7440-09-7	1	mg/L	14	9	11	----	----
<b>EG020F: Dissolved Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	0.007	0.004	0.015	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Copper	7440-50-8	0.001	mg/L	0.002	0.003	<0.001	----	----
Lead	7439-92-1	0.001	mg/L	0.001	<0.001	<0.001	----	----
Manganese	7439-96-5	0.001	mg/L	0.288	0.917	0.354	----	----
Nickel	7440-02-0	0.001	mg/L	0.012	0.015	0.025	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	----	----
Zinc	7440-66-6	0.005	mg/L	0.011	0.084	0.012	----	----
Boron	7440-42-8	0.05	mg/L	0.06	0.06	<0.05	----	----
<b>EG035F: Dissolved Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
<b>EG051G: Ferrous Iron by Discrete Analyser</b>								
Ferrous Iron	----	0.05	mg/L	<0.05	11.7	0.40	----	----
<b>EK040P: Fluoride by PC Titrator</b>								
Fluoride	16984-48-8	0.1	mg/L	0.2	0.2	0.3	----	----
<b>EN055: Ionic Balance</b>								
Total Anions	----	0.01	meq/L	1.74	2.87	1.90	----	----
Total Cations	----	0.01	meq/L	1.67	2.49	1.88	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MWMP_01	MWMP_02	MWMP_03	----	----
				03-OCT-2013 15:00	03-OCT-2013 15:00	03-OCT-2013 15:00	----	----
Compound	CAS Number	LOR	Unit	ES1321739-001	ES1321739-002	ES1321739-003	----	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	5	µg/L	<5	<5	<5	----	----
Isopropylbenzene	98-82-8	5	µg/L	<5	<5	<5	----	----
n-Propylbenzene	103-65-1	5	µg/L	<5	<5	<5	----	----
1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	<5	----	----
sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	<5	----	----
1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	<5	----	----
tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	<5	----	----
p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	<5	----	----
n-Butylbenzene	104-51-8	5	µg/L	<5	<5	<5	----	----
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	50	µg/L	<50	<50	<50	----	----
2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	<50	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	<50	----	----
2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	<50	----	----
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	5	µg/L	<5	<5	<5	----	----
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	<5	----	----
1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	<5	----	----
cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	<5	----	----
trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	<5	----	----
1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	<5	----	----
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	<50	----	----
Chloromethane	74-87-3	50	µg/L	<50	<50	<50	----	----
Vinyl chloride	75-01-4	50	µg/L	<50	<50	<50	----	----
Bromomethane	74-83-9	50	µg/L	<50	<50	<50	----	----
Chloroethane	75-00-3	50	µg/L	<50	<50	<50	----	----
Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	<50	----	----
1,1-Dichloroethene	75-35-4	5	µg/L	<5	<5	<5	----	----
Iodomethane	74-88-4	5	µg/L	<5	<5	<5	----	----
trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	<5	<5	----	----
1,1-Dichloroethane	75-34-3	5	µg/L	<5	<5	<5	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MWMP_01	MWMP_02	MWMP_03	----	----
				03-OCT-2013 15:00	03-OCT-2013 15:00	03-OCT-2013 15:00	----	----
Compound	CAS Number	LOR	Unit	ES1321739-001	ES1321739-002	ES1321739-003	----	----
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	<5	<5	----	----
1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	<5	<5	----	----
1,1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	<5	----	----
Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	<5	----	----
1,2-Dichloroethane	107-06-2	5	µg/L	<5	<5	<5	----	----
Trichloroethene	79-01-6	5	µg/L	<5	<5	<5	----	----
Dibromomethane	74-95-3	5	µg/L	<5	<5	<5	----	----
1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	<5	<5	----	----
1,3-Dichloropropane	142-28-9	5	µg/L	<5	<5	<5	----	----
Tetrachloroethene	127-18-4	5	µg/L	<5	<5	<5	----	----
1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	<5	----	----
trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	<5	----	----
cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	<5	----	----
1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	<5	----	----
1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	<5	<5	----	----
Pentachloroethane	76-01-7	5	µg/L	<5	<5	<5	----	----
1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	<5	----	----
Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	<5	----	----
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	5	µg/L	<5	<5	<5	----	----
Bromobenzene	108-86-1	5	µg/L	<5	<5	<5	----	----
2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	<5	----	----
4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	<5	----	----
1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	<5	----	----
1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	<5	----	----
1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	<5	----	----
1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	<5	----	----
1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	<5	----	----
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	5	µg/L	<5	<5	<5	----	----
Bromodichloromethane	75-27-4	5	µg/L	<5	<5	<5	----	----
Dibromochloromethane	124-48-1	5	µg/L	<5	<5	<5	----	----
Bromoform	75-25-2	5	µg/L	<5	<5	<5	----	----





## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MWMP_01	MWMP_02	MWMP_03	---	---
				03-OCT-2013 15:00	03-OCT-2013 15:00	03-OCT-2013 15:00	---	---
Compound	CAS Number	LOR	Unit	ES1321739-001	ES1321739-002	ES1321739-003	---	---
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	7	µg/L	<7	<7	<7	---	---
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	<1.0	---	---
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	<1.0	---	---
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	<1.0	---	---
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	<2.0	---	---
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	<1.0	---	---
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	<1.0	---	---
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	<1.0	---	---
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	<1.0	---	---
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	<1.0	---	---
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	<1.0	---	---
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	<1.0	---	---
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	<2.0	---	---
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	---	---
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	---	---
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	---	---
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	---	---
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	---	---
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	---	---
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	---	---
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	---	---
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	---	---
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	---	---
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	<1.0	---	---
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	---	---
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	---	---
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	---	---
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	---	---
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	---	---
^ Sum of polycyclic aromatic hydrocarbons	---	0.5	µg/L	<0.5	<0.5	<0.5	---	---
^ Benzo(a)pyrene TEQ (zero)	---	0.5	µg/L	<0.5	<0.5	<0.5	---	---



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MWMP_01	MWMP_02	MWMP_03	----	----
				03-OCT-2013 15:00	03-OCT-2013 15:00	03-OCT-2013 15:00	----	----
Compound	CAS Number	LOR	Unit	ES1321739-001	ES1321739-002	ES1321739-003	----	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	20	µg/L	70	<20	<20	----	----
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	----	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	----	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	20	µg/L	70	<20	<20	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	50	<20	<20	----	----
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	<100	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	----	----
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	2	<1	<1	----	----
Toluene	108-88-3	2	µg/L	4	<2	<2	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	6	<2	<2	----	----
ortho-Xylene	95-47-6	2	µg/L	9	<2	<2	----	----
^ Total Xylenes	1330-20-7	2	µg/L	15	<2	<2	----	----
^ Sum of BTEX	----	1	µg/L	21	<1	<1	----	----
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	----	----
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	120	116	112	----	----
Toluene-D8	2037-26-5	0.1	%	128	116	105	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	124	110	105	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	30.0	28.6	30.6	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	67.7	74.2	76.6	----	----
2,4,6-Tribromophenol	118-79-6	0.1	%	77.3	82.0	87.6	----	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	20.8	44.2	81.3	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				MWMP_01	MWMP_02	MWMP_03	----	----
				03-OCT-2013 15:00	03-OCT-2013 15:00	03-OCT-2013 15:00	----	----
				ES1321739-001	ES1321739-002	ES1321739-003	----	----
Compound	CAS Number	LOR	Unit					
<b>EP075(SIM)T: PAH Surrogates - Continued</b>								
Anthracene-d10	1719-06-8	0.1	%	77.7	85.0	88.1	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	85.7	94.3	96.9	----	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	115	111	107	----	----
Toluene-D8	2037-26-5	0.1	%	118	107	98.0	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	118	108	99.6	----	----



## Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP074S: VOC Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	78.3	133.2
Toluene-D8	2037-26-5	79.1	128.9
4-Bromofluorobenzene	460-00-4	80.8	123.7
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	10.0	44
2-Chlorophenol-D4	93951-73-6	14	94
2,4,6-Tribromophenol	118-79-6	17	125
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27.4	113
4-Terphenyl-d14	1718-51-0	32	112
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: ES1321739</b>	<b>Page</b>	<b>: 1 of 14</b>
<b>Client</b>	<b>: ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	<b>: Environmental Division Sydney</b>
<b>Contact</b>	<b>: MR JONATHAN LEKAWSKI</b>	<b>Contact</b>	<b>: Barbara Hanna</b>
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<b>Project</b>	<b>: 0207423 MT PIPER (SYMPHONY) STAGE 2</b>	<b>QC Level</b>	<b>: NEPM 2013 Schedule B(3) and ALS QCS3 requirement</b>
<b>Site</b>	<b>: MT. PIPER</b>	<b>Date Samples Received</b>	<b>: 04-OCT-2013</b>
<b>C-O-C number</b>	<b>: 13214</b>	<b>Issue Date</b>	<b>: 11-OCT-2013</b>
<b>Sampler</b>	<b>: GAVIN POWELL</b>	<b>No. of samples received</b>	<b>: 3</b>
<b>Order number</b>	<b>: ----</b>	<b>No. of samples analysed</b>	<b>: 3</b>
<b>Quote number</b>	<b>: SY/551/13 V4</b>		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Organics



### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :            Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
                  CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
                  LOR = Limit of reporting  
                  RPD = Relative Percentage Difference  
                  # = Indicates failed QC





## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>ED037P: Alkalinity by PC Titrator (QC Lot: 3092422)</b>									
ES1321739-001	MWMP_01	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	50	52	3.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	50	52	3.7	0% - 20%
ES1321744-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	6	10	43.9	0% - 50%
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	160	157	2.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	166	167	0.0	0% - 20%
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3092734)</b>									
ES1321742-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2	2	0.0	No Limit
ES1321750-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	4220	4190	0.8	0% - 20%
<b>ED045G: Chloride Discrete analyser (QC Lot: 3092733)</b>									
ES1321653-004	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1050	1230	16.2	0% - 20%
ES1321750-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	20000	20000	0.1	0% - 20%
<b>ED093F: Dissolved Major Cations (QC Lot: 3092732)</b>									
ES1321653-004	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	142	143	1.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	110	109	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	663	670	1.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	18	18	0.0	0% - 50%
ES1321739-003	MWMP_03	ED093F: Calcium	7440-70-2	1	mg/L	9	9	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	6	6	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	15	14	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	11	11	0.0	0% - 50%
<b>EG020F: Dissolved Metals by ICP-MS (QC Lot: 3094867)</b>									
ES1321663-003	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.082	0.090	10.0	0% - 50%
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.0	No Limit
ES1321729-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0001	0.0001	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG020F: Dissolved Metals by ICP-MS (QC Lot: 3094867) - continued</b>									
ES1321729-001	Anonymous	EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.010	0.010	0.0	0% - 50%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.009	0.008	17.8	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.013	0.013	0.0	0% - 50%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.128	0.131	2.2	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.036	0.040	9.8	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	0.08	0.09	0.0	No Limit
<b>EG035F: Dissolved Mercury by FIMS (QC Lot: 3094866)</b>									
ES1321663-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1321663-011	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
<b>EG051G: Ferrous Iron by Discrete Analyser (QC Lot: 3092308)</b>									
ES1321618-001	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	0.52	0.52	0.0	0% - 50%
ES1321742-002	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	0.83	0.82	0.0	0% - 50%
<b>EK040P: Fluoride by PC Titrator (QC Lot: 3092423)</b>									
ES1321739-001	MWMP_01	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.2	0.2	0.0	No Limit
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3093297)</b>									
ES1321739-001	MWMP_01	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
<b>EP074B: Oxygenated Compounds (QC Lot: 3093297)</b>									
ES1321739-001	MWMP_01	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
<b>EP074C: Sulfonated Compounds (QC Lot: 3093297)</b>									
ES1321739-001	MWMP_01	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
<b>EP074D: Fumigants (QC Lot: 3093297)</b>									
ES1321739-001	MWMP_01	EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074D: Fumigants (QC Lot: 3093297) - continued</b>									
ES1321739-001	MWMP_01	EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3093297)</b>									
ES1321739-001	MWMP_01	EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit		
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit		
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3093297)</b>									
ES1321739-001	MWMP_01	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit		



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074G: Trihalomethanes (QC Lot: 3093297)</b>									
ES1321739-001	MWMP_01	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
<b>EP074H: Naphthalene (QC Lot: 3093297)</b>									
ES1321739-001	MWMP_01	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3093298)</b>									
ES1321739-001	MWMP_01	EP080: C6 - C9 Fraction	----	20	µg/L	70	60	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3093298)</b>									
ES1321739-001	MWMP_01	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	70	70	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3093298)</b>									
ES1321739-001	MWMP_01	EP080: Benzene	71-43-2	1	µg/L	2	1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	4	4	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	6	5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	9	8	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit



### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
<b>ED037P: Alkalinity by PC Titrator (QCLot: 3092422)</b>								
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	----	200 mg/L	102	81	111
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3092734)</b>								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	105	86	122
<b>ED045G: Chloride Discrete analyser (QCLot: 3092733)</b>								
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	120	77	123
<b>ED093F: Dissolved Major Cations (QCLot: 3092732)</b>								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	103	87	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.6	89	113
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	107	79	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	104	87	115
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3094867)</b>								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	95.9	80	118
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	87.6	82	112
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	93.4	81	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	94.4	80	112
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	90.2	83	111
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	87.9	81	113
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	86.2	81	113
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	91.0	73	125
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	95.2	80	116
EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.1 mg/L	93.9	69	123
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3094866)</b>								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	97.8	78	114
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3092308)</b>								
EG051G: Ferrous Iron	----	0.10	mg/L	<0.10	2.00 mg/L	94.0	89	113
<b>EK040P: Fluoride by PC Titrator (QCLot: 3092423)</b>								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5.0 mg/L	114	75	119
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3093297)</b>								
EP074: Styrene	100-42-5	5	µg/L	<5	10 µg/L	89.5	74	118
EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	10 µg/L	94.7	75	121
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	10 µg/L	95.5	67	123
EP074: 1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	10 µg/L	99.4	70	122
EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	10 µg/L	98.0	69	123



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3093297) - continued</b>									
EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	10 µg/L	96.7	71	121	
EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	10 µg/L	97.8	70	122	
EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	10 µg/L	98.2	67	123	
EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	10 µg/L	100	62	126	
<b>EP074B: Oxygenated Compounds (QCLot: 3093297)</b>									
EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	100 µg/L	98.2	61.4	134	
EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	100 µg/L	87.2	73.6	130	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	100 µg/L	86.8	61	139	
EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	100 µg/L	81.9	65	137	
<b>EP074C: Sulfonated Compounds (QCLot: 3093297)</b>									
EP074: Carbon disulfide	75-15-0	5	µg/L	<5	10 µg/L	114	72.8	127	
<b>EP074D: Fumigants (QCLot: 3093297)</b>									
EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	10 µg/L	107	61	119	
EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	10 µg/L	95.5	76	120	
EP074: cis-1,3-Dichloropropylene	10061-01-5	10	µg/L	<10	10 µg/L	102	62	120	
EP074: trans-1,3-Dichloropropylene	10061-02-6	10	µg/L	<10	10 µg/L	100	61	119	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	10 µg/L	92.8	69	117	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3093297)</b>									
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	100 µg/L	91.4	60.6	138	
EP074: Chloromethane	74-87-3	50	µg/L	<50	100 µg/L	101	67.4	130	
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	100 µg/L	116	69.4	129	
EP074: Bromomethane	74-83-9	50	µg/L	<50	100 µg/L	126	56	140	
EP074: Chloroethane	75-00-3	50	µg/L	<50	100 µg/L	118	63	135	
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	100 µg/L	# 132	65	131	
EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	10 µg/L	116	69	123	
EP074: Iodomethane	74-88-4	5	µg/L	<5	10 µg/L	115	70.2	128	
EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	10 µg/L	103	71	119	
EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	10 µg/L	103	75	119	
EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	10 µg/L	98.3	77	117	
EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	10 µg/L	108	61	119	
EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	10 µg/L	101	73	119	
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	10 µg/L	116	63	121	
EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	10 µg/L	110	78	122	
EP074: Trichloroethene	79-01-6	5	µg/L	<5	10 µg/L	99.1	74	120	
EP074: Dibromomethane	74-95-3	5	µg/L	<5	10 µg/L	101	74	118	
EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	10 µg/L	87.8	75	123	
EP074: 1,3-Dichloropropane	142-28-9	5	µg/L	<5	10 µg/L	86.4	79	121	
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	10 µg/L	98.4	72	124	





Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	High
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3093297) - continued</b>									
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	10 µg/L	106	66	114	
EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	10 µg/L	88.6	60	120	
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	10 µg/L	77.9	70.6	128	
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	10 µg/L	80.2	70	124	
EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	10 µg/L	84.0	74	128	
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	10 µg/L	110	71.8	126	
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	10 µg/L	101	66.4	136	
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	10 µg/L	122	58	132	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3093297)</b>									
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	10 µg/L	93.8	80	118	
EP074: Bromobenzene	108-86-1	5	µg/L	<5	10 µg/L	87.9	76	116	
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	10 µg/L	100	71	121	
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	10 µg/L	100	71	121	
EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	10 µg/L	96.9	74	120	
EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	10 µg/L	102	72	120	
EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	10 µg/L	93.4	77	117	
EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	10 µg/L	106	60	126	
EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	10 µg/L	105	67	125	
<b>EP074G: Trihalomethanes (QCLot: 3093297)</b>									
EP074: Chloroform	67-66-3	5	µg/L	<5	10 µg/L	100	76	118	
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	10 µg/L	106	64	118	
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	10 µg/L	94.6	65	115	
EP074: Bromoform	75-25-2	5	µg/L	<5	10 µg/L	103	73.5	126	
<b>EP074H: Naphthalene (QCLot: 3093297)</b>									
EP074: Naphthalene	91-20-3	7	µg/L	<7	10 µg/L	95.2	61	125	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3091771)</b>									
EP075(SIM): Phenol	108-95-2	0.2	µg/L	----	20 µg/L	41.4	24.5	61.9	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Chlorophenol	95-57-8	0.2	µg/L	----	20 µg/L	90.6	63.8	110	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Methylphenol	95-48-7	0.2	µg/L	----	20 µg/L	92.1	55.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	0.4	µg/L	----	40 µg/L	89.3	42.5	114	
		2	µg/L	<2.0	----	----	----	----	
EP075(SIM): 2-Nitrophenol	88-75-5	0.2	µg/L	----	20 µg/L	101	62.7	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.2	µg/L	----	20 µg/L	99.0	59.9	112	
		1	µg/L	<1.0	----	----	----	----	



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
					LCS	Low	High	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3091771) - continued</b>								
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.2	µg/L	----	20 µg/L	113	59.3	122
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.2	µg/L	----	20 µg/L	112	64.3	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.2	µg/L	----	20 µg/L	106	63	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.2	µg/L	----	20 µg/L	107	58.7	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.2	µg/L	----	20 µg/L	106	50	108
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Pentachlorophenol	87-86-5	0.4	µg/L	----	40 µg/L	# 99.8	8.7	95
		2	µg/L	<2.0	----	----	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3091771)</b>								
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	20 µg/L	105	58.6	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	20 µg/L	104	63.6	114
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	20 µg/L	106	62.2	113
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	20 µg/L	108	63.9	115
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	20 µg/L	106	62.6	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	20 µg/L	105	64.3	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	20 µg/L	109	63.6	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	20 µg/L	110	63.1	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	20 µg/L	107	64.1	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	20 µg/L	106	62.5	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	20 µg/L	107	61.7	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	20 µg/L	102	61.7	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	20 µg/L	107	63.3	117
		0.5	µg/L	<0.5	----	----	----	----



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3091771) - continued</b>									
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	20 µg/L	102	59.9	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	----	20 µg/L	104	61.2	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	----	20 µg/L	105	59.1	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	1	µg/L	<1.0	----	----	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3091769)</b>									
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	72.4	59	129	
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	92.9	71	131	
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	83.5	62	120	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3093298)</b>									
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	93.1	75	127	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3091769)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	2500 µg/L	82.2	58.9	131	
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	92.6	73.9	138	
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----	
		50	µg/L	----	1500 µg/L	84.9	67	127	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3093298)</b>									
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	93.9	75	127	
<b>EP080: BTEXN (QCLot: 3093298)</b>									
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	101	70	124	
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	95.6	65	129	
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	102	70	120	
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	111	69	121	
	106-42-3								
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	100	72	122	
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	103	70	124	

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report				
				Spike Concentration	Spike Recovery(%)		Recovery Limits (%)	
					MS	Low	High	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3092734)</b>								
ES1321742-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	109	70	130	



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report				
				Spike	SpikeRecovery(%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>ED045G: Chloride Discrete analyser (QCLot: 3092733)</b>								
ES1321653-004	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	# Not Determined	70	130	
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3094867)</b>								
ES1321663-004	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	98.6	70	130	
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	98.7	70	130	
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	98.0	70	130	
		EG020A-F: Copper	7440-50-8	0.2 mg/L	97.0	70	130	
		EG020A-F: Lead	7439-92-1	0.2 mg/L	106	70	130	
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	94.5	70	130	
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	94.4	70	130	
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	96.5	70	130	
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3094866)</b>								
ES1321663-002	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	91.5	70	130	
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3092308)</b>								
ES1321618-001	Anonymous	EG051G: Ferrous Iron	----	1.00 mg/L	110	68	128	
<b>EK040P: Fluoride by PC Titrator (QCLot: 3092423)</b>								
ES1321739-001	MWMP_01	EK040P: Fluoride	16984-48-8	5.0 mg/L	96.0	70	130	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3093297)</b>								
ES1321739-001	MWMP_01	EP074: 1,1-Dichloroethene	75-35-4	25 µg/L	123	70	130	
		EP074: Trichloroethene	79-01-6	25 µg/L	106	70	130	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3093297)</b>								
ES1321739-001	MWMP_01	EP074: Chlorobenzene	108-90-7	25 µg/L	111	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3093298)</b>								
ES1321739-001	MWMP_01	EP080: C6 - C9 Fraction	----	325 µg/L	102	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3093298)</b>								
ES1321739-001	MWMP_01	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	102	70	130	
<b>EP080: BTEXN (QCLot: 3093298)</b>								
ES1321739-001	MWMP_01	EP080: Benzene	71-43-2	25 µg/L	95.5	70	130	
		EP080: Toluene	108-88-3	25 µg/L	102	70	130	
		EP080: Ethylbenzene	100-41-4	25 µg/L	105	70	130	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	105	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	25 µg/L	104	70	130	
		EP080: Naphthalene	91-20-3	25 µg/L	103	70	130	



The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
					MS	MSD	Low	High	Value	Control Limit	
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3092308)</b>											
ES1321618-001	Anonymous	EG051G: Ferrous Iron	----	1.00 mg/L	110	----	68	128	----	----	
<b>EK040P: Fluoride by PC Titrator (QCLot: 3092423)</b>											
ES1321739-001	MWMP_01	EK040P: Fluoride	16984-48-8	5.0 mg/L	96.0	----	70	130	----	----	
<b>ED045G: Chloride Discrete analyser (QCLot: 3092733)</b>											
ES1321653-004	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	# Not Determined	----	70	130	----	----	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3092734)</b>											
ES1321742-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	109	----	70	130	----	----	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3093297)</b>											
ES1321739-001	MWMP_01	EP074: 1,1-Dichloroethene	75-35-4	25 µg/L	123	----	70	130	----	----	
		EP074: Trichloroethene	79-01-6	25 µg/L	106	----	70	130	----	----	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3093297)</b>											
ES1321739-001	MWMP_01	EP074: Chlorobenzene	108-90-7	25 µg/L	111	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3093298)</b>											
ES1321739-001	MWMP_01	EP080: C6 - C9 Fraction	----	325 µg/L	102	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3093298)</b>											
ES1321739-001	MWMP_01	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	102	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3093298)</b>											
ES1321739-001	MWMP_01	EP080: Benzene	71-43-2	25 µg/L	95.5	----	70	130	----	----	
		EP080: Toluene	108-88-3	25 µg/L	102	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	25 µg/L	105	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	105	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	25 µg/L	104	----	70	130	----	----	
		EP080: Naphthalene	91-20-3	25 µg/L	103	----	70	130	----	----	
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3094866)</b>											
ES1321663-002	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	91.5	----	70	130	----	----	
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3094867)</b>											
ES1321663-004	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	98.6	----	70	130	----	----	
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	98.7	----	70	130	----	----	
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	98.0	----	70	130	----	----	
		EG020A-F: Copper	7440-50-8	0.2 mg/L	97.0	----	70	130	----	----	
		EG020A-F: Lead	7439-92-1	0.2 mg/L	106	----	70	130	----	----	
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	94.5	----	70	130	----	----	
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	94.4	----	70	130	----	----	

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 Work Order : ES1321739  
 Client : ENVIRO RESOURCES MANAGEMENT  
 Project : 0207423 MT PIPER (SYMPHONY) STAGE 2



Sub-Matrix: **WATER**

					<i>Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report</i>					
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>Spike</i>	<i>Spike Recovery (%)</i>		<i>Recovery Limits (%)</i>		<i>RPDs (%)</i>	
				<i>Concentration</i>	<i>MS</i>	<i>MSD</i>	<i>Low</i>	<i>High</i>	<i>Value</i>	<i>Control Limit</i>
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3094867) - continued</b>										
ES1321663-004	Anonymous	EG020A-F: Zinc	7440-66-6	0.2 mg/L	96.5	----	70	130	----	----



## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1321739</b>	Page	: 1 of 9
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
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Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: 0207423 MT PIPER (SYMPHONY) STAGE 2	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: MT. PIPER	Date Samples Received	: 04-OCT-2013
C-O-C number	: 13214	Issue Date	: 11-OCT-2013
Sampler	: GAVIN POWELL	No. of samples received	: 3
Order number	: ----	No. of samples analysed	: 3
Quote number	: SY/551/13 V4		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER** Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>ED037P: Alkalinity by PC Titrator</b>								
Clear Plastic Bottle - Natural (ED037-P) MWMP_01, MWMP_03	MWMP_02,	03-OCT-2013	---	17-OCT-2013	----	04-OCT-2013	17-OCT-2013	✓
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Clear Plastic Bottle - Natural (ED041G) MWMP_01, MWMP_03	MWMP_02,	03-OCT-2013	---	31-OCT-2013	----	04-OCT-2013	31-OCT-2013	✓
<b>ED045G: Chloride Discrete analyser</b>								
Clear Plastic Bottle - Natural (ED045G) MWMP_01, MWMP_03	MWMP_02,	03-OCT-2013	---	31-OCT-2013	----	04-OCT-2013	31-OCT-2013	✓
<b>ED093F: Dissolved Major Cations</b>								
Clear Plastic Bottle - Natural (ED093F) MWMP_01, MWMP_03	MWMP_02,	03-OCT-2013	---	10-OCT-2013	----	04-OCT-2013	10-OCT-2013	✓
<b>EG020F: Dissolved Metals by ICP-MS</b>								
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) MWMP_01, MWMP_03	MWMP_02,	03-OCT-2013	---	01-APR-2014	----	08-OCT-2013	01-APR-2014	✓
<b>EG035F: Dissolved Mercury by FIMS</b>								
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) MWMP_01, MWMP_03	MWMP_02,	03-OCT-2013	---	31-OCT-2013	----	09-OCT-2013	31-OCT-2013	✓
<b>EG051G: Ferrous Iron by Discrete Analyser</b>								
Clear Plastic Bottle - Natural (EG051G) MWMP_01, MWMP_03	MWMP_02,	03-OCT-2013	----	----	----	04-OCT-2013	04-OCT-2013	✓
<b>EK040P: Fluoride by PC Titrator</b>								
Clear Plastic Bottle - Natural (EK040P) MWMP_01, MWMP_03	MWMP_02,	03-OCT-2013	---	31-OCT-2013	----	04-OCT-2013	31-OCT-2013	✓



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
<b>Amber Glass Bottle - Unpreserved (EP071)</b>								
MWMP_01, MWMP_03	MWMP_02,	03-OCT-2013	04-OCT-2013	10-OCT-2013	✓	05-OCT-2013	13-NOV-2013	✓
<b>EP074D: Fumigants</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b>								
MWMP_01, MWMP_03	MWMP_02,	03-OCT-2013	08-OCT-2013	17-OCT-2013	✓	08-OCT-2013	17-OCT-2013	✓
<b>EP074E: Halogenated Aliphatic Compounds</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b>								
MWMP_01, MWMP_03	MWMP_02,	03-OCT-2013	08-OCT-2013	17-OCT-2013	✓	08-OCT-2013	17-OCT-2013	✓
<b>EP074F: Halogenated Aromatic Compounds</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b>								
MWMP_01, MWMP_03	MWMP_02,	03-OCT-2013	08-OCT-2013	17-OCT-2013	✓	08-OCT-2013	17-OCT-2013	✓
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b>								
MWMP_01, MWMP_03	MWMP_02,	03-OCT-2013	08-OCT-2013	17-OCT-2013	✓	08-OCT-2013	17-OCT-2013	✓
<b>EP074H: Naphthalene</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b>								
MWMP_01, MWMP_03	MWMP_02,	03-OCT-2013	08-OCT-2013	17-OCT-2013	✓	08-OCT-2013	17-OCT-2013	✓
<b>EP074B: Oxygenated Compounds</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b>								
MWMP_01, MWMP_03	MWMP_02,	03-OCT-2013	08-OCT-2013	17-OCT-2013	✓	08-OCT-2013	17-OCT-2013	✓
<b>EP074C: Sulfonated Compounds</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b>								
MWMP_01, MWMP_03	MWMP_02,	03-OCT-2013	08-OCT-2013	17-OCT-2013	✓	08-OCT-2013	17-OCT-2013	✓
<b>EP074G: Trihalomethanes</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b>								
MWMP_01, MWMP_03	MWMP_02,	03-OCT-2013	08-OCT-2013	17-OCT-2013	✓	08-OCT-2013	17-OCT-2013	✓
<b>EP075(SIM)A: Phenolic Compounds</b>								
<b>Amber Glass Bottle - Unpreserved (EP075(SIM))</b>								
MWMP_01, MWMP_03	MWMP_02,	03-OCT-2013	04-OCT-2013	10-OCT-2013	✓	05-OCT-2013	13-NOV-2013	✓



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
<b>Amber Glass Bottle - Unpreserved (EP075(SIM))</b> MWMP_01, MWMP_03	MWMP_02,	03-OCT-2013	04-OCT-2013	10-OCT-2013	✓	05-OCT-2013	13-NOV-2013	✓
<b>EP080: BTEXN</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MWMP_01, MWMP_03	MWMP_02,	03-OCT-2013	08-OCT-2013	17-OCT-2013	✓	08-OCT-2013	17-OCT-2013	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MWMP_01, MWMP_03	MWMP_02,	03-OCT-2013	08-OCT-2013	17-OCT-2013	✓	08-OCT-2013	17-OCT-2013	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Alkalinity by PC Titrator	ED037-P	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	18	11.1	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	2	14	14.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	2	18	11.1	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	5	20.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	4	25.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	5	20.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
Alkalinity by PC Titrator	ED037-P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	18	11.1	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	14	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	5	20.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	10	10.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	4	25.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	5	20.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
Chloride by Discrete Analyser	ED045G	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	14	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	5	20.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	10	10.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	4	25.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	5	20.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							



Matrix: **WATER** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Matrix Spikes (MS) - Continued</b>							
Chloride by Discrete Analyser	ED045G	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	14	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	5	20.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	4	25.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	5	20.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement





## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Sulfate (Turbidimetric) as SO <sub>4</sub> <sup>2-</sup> by Discrete Analyser	ED041G	WATER	APHA 21st ed., 4500-SO <sub>4</sub> Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> <sup>2-</sup> concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Chloride by Discrete Analyser	ED045G	WATER	APHA 21st ed., 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	Major Cations is determined based on APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um filtered sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Hardness parameters are calculated based on APHA 21st ed., 2340 B. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): Samples are 0.45 um filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) Samples are 0.45 um filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Ferrous Iron by Discrete Analyser	EG051G	WATER	APHA 21st ed., 3500 Fe-B. A colorimetric determination based on the reaction between phenanthroline and ferrous iron at pH 3.2-3.3 to form an orange-red complex that is measured against a five-point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Fluoride by PC Titrator	EK040P	WATER	APHA 21st ed., 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)



<i>Analytical Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by Turbi SO4 by DA. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
TPH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Volatile Organic Compounds	EP074	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
TPH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Separatory Funnel Extraction of Liquids	ORG14	WATER	USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.



## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Laboratory Control Spike (LCS) Recoveries</b>							
EP074E: Halogenated Aliphatic Compounds	3687444-002	----	Trichlorofluoromethane	75-69-4	132 %	65-131%	Recovery greater than upper control limit
EP075(SIM)A: Phenolic Compounds	3685603-013	----	Pentachlorophenol	87-86-5	99.8 %	8.7-95%	Recovery greater than upper control limit
<b>Matrix Spike (MS) Recoveries</b>							
ED045G: Chloride Discrete analyser	ES1321653-004	Anonymous	Chloride	16887-00-6	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.

#### Regular Sample Surrogates

Sub-Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Samples Submitted</b>							
EP074S: VOC Surrogates	ES1321739-001	MWMP_01	4-Bromofluorobenzene	460-00-4	124 %	80.8-123.7 %	Recovery greater than upper data quality objective

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- No Analysis Holding Time Outliers exist.

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

**Work Order : ES1321739**

<p><b>Client : ENVIRO RESOURCES MANAGEMENT</b></p> <p><b>Contact : MR JONATHAN LEKAWSKI</b></p> <p><b>Address : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007</b></p>	<p><b>Laboratory : Environmental Division Sydney</b></p> <p><b>Contact : Barbara Hanna</b></p> <p><b>Address : 277-289 Woodpark Road Smithfield NSW Australia 2164</b></p>
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<p><b>E-mail : jonathan.lekawski@erm.com</b></p> <p><b>Telephone : +61 02 8584 8888</b></p> <p><b>Facsimile : +61 02 8584 8800</b></p>	<p><b>E-mail : Barbara.Hanna@alsglobal.com</b></p> <p><b>Telephone : +61 2 8784 8555</b></p> <p><b>Facsimile : +61 2 8784 8555</b></p>
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<p><b>Project : 0207423 MT PIPER (SYMPHONY) STAGE 2</b></p>	<p><b>Page : 1 of 2</b></p>
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<p><b>Order number : ----</b></p> <p><b>C-O-C number : 13214</b></p> <p><b>Site : MT. PIPER</b></p> <p><b>Sampler : GAVIN POWELL</b></p>	<p><b>Quote number : ES2013ENVRES0354 (EN/009/13)</b></p> <p><b>QC Level : NEPM 2013 Schedule B(3) and ALS QCS3 requirement</b></p>
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#### Dates

<p><b>Date Samples Received : 04-OCT-2013</b></p> <p><b>Client Requested Due Date : 11-OCT-2013</b></p>	<p><b>Issue Date : 04-OCT-2013 10:19</b></p> <p><b>Scheduled Reporting Date : <b>11-OCT-2013</b></b></p>
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#### Delivery Details

<p><b>Mode of Delivery : Carrier</b></p> <p><b>No. of coolers/boxes : 1 HARD</b></p> <p><b>Security Seal : Intact.</b></p>	<p><b>Temperature : 11.2°C - Ice bricks present</b></p> <p><b>No. of samples received : 3</b></p> <p><b>No. of samples analysed : 3</b></p>
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#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Sample containers do not comply to pretreatment / preservation standards (AS, APHA, USEPA). Please refer to the Sample Container(s)/Preservation Non-Compliance Log at the end of this report for details.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

Method Client sample ID	Sample Container Received	Preferred Sample Container for Analysis
<b>EG051G : Ferrous Iron by Discrete Analyser</b>		
MWMP_01	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - HCl - Filtered
MWMP_02	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - HCl - Filtered
MWMP_03	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - HCl - Filtered

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EG020F Dissolved Metals by ICPMS	WATER - EG051G Ferrous Iron by Discrete Analyser	WATER - EK040-P Fluoride(PC)	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP074 (water) Volatile Organic Compounds	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)	WATER - W-27 TRH/IBTEXN/PAH/Phenols/8 Metals
ES1321739-001	03-OCT-2013 15:00	MWMP_01	✓	✓	✓	✓	✓	✓	✓	✓
ES1321739-002	03-OCT-2013 15:00	MWMP_02	✓	✓	✓	✓	✓	✓	✓	✓
ES1321739-003	03-OCT-2013 15:00	MWMP_03	✓	✓	✓	✓	✓	✓	✓	✓

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

## Requested Deliverables

### MR JONATHAN LEKAWSKI

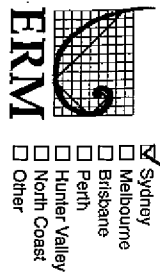
- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
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Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com



Sydney  
 Melbourne  
 Brisbane  
 Perth  
 Hunter Valley  
 North Coast  
 Other

Grand Floor, 33 Saunders Street, Pyrmont, NSW, 2009. (ph) 02 8584 8888 (fax) 02 8594 8800  
 Level 3, Yarra Tower, WTC, 18-38 Siddley Street, Docklands, VIC, 3005. (ph) 03 8696 8011 (fax) 03 8696 8022  
 Level 1, 80 Leichhardt Street, Spring Hill, QLD, 4004. (ph) 07 3839 8993 (fax) 07 3839 8981  
 Level 6, Grain Pool Bld, 172 St Georges Tce, WA, 6850. (ph) 08 9321 5200 (fax) 08 9321 5262  
 53 Bonville Avenue, Thornton, NSW, 2322. (ph) 02 4964 2150 (fax) 02 4964 2152  
 Suite 3/146 Gordon Street, Fort Macquarie, NSW, 2444. (ph) 02 6564 7155 (fax) 02 6564 7160

Project No: 0107243  
 Project Name: Mt Piper (Symphony) Stage 2  
 Project Location: Mt Piper  
 Project Manager: Jonathan Leksanski  
 Sampler: Gavin Powell  
 Laboratory: ALS  
 COC Number: A 13214

General Analysis Requirements

1. Turn Around Time (please tick):  1 Day  2 Days  Normal (TAT)
2. Do you wish any sediment layers in water to be excluded from extractions?
3. Additional QA/QC reported where sample batches are < 10 samples?
4. % of extraneous material removed from samples to be reported as per NERP 5.1.1?

Laboratory Number	Sample ID	Sample Depth	Sample Date	Sample Time	Matrix			Preservation		Containers (numbers/type)	BTX	TPH (C6-C9 P & T) + TPH (C10-C36)	Speciated TPH	VOC Scan (USEPA 8260 List)	SVOC Scan (USEPA 8270 List)	OC OP Pesticides	PAH	Phenols	PCB	Metals* (dissolved/total)	Ferrous Iron	TRH	VOC's	Chlorinated Hydrocarbons	Cations	Anions	Other Comments on sample (eg: high voc, highly contaminated, special detection limits etc etc)
					Water	Soil	Other	Ice	Acid																		
1	MWMP_01		3/10	PM	X			X		5	X									X	X	X	X	X	X		
2	MWMP_02		3/10	PM	X			X		5	X									X	X	X	X	X	X		
3	MWMP_03		3/10	PM	X			X		5	X									X	X	X	X	X	X		
	Interpolated																										
	Trapped Blank																										

Environmental Division  
 Sydney  
 Work Order  
**ES1321739**  
  
 Telephone : + 61-2-8784 8555

Comments: please see Barbara Hanna for ERM lab quote

\*Metals (circle)  
 BFI Mn Se

Relinquished by: Gavin Powell  
 Signed:   
 Date/Time: 3/10/13  
 Received by: David  
 Date/Time: 4/10 0820



## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>ES1323608</b> <b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : MR JONATHAN LEKAWSKI <b>Address</b> : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007  <b>E-mail</b> : jonathan.lekawski@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800 <b>Project</b> : WALLERAWANG MT PIPER GW <b>Order number</b> : 0207423/0207420 <b>C-O-C number</b> : ---- <b>Sampler</b> : D.B/S.H <b>Site</b> : ----  <b>Quote number</b> : SY/278/13 V3	<b>Page</b> : 1 of 10  <b>Laboratory</b> : Environmental Division Sydney <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164  <b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555 <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement  <b>Date Samples Received</b> : 01-NOV-2013 <b>Issue Date</b> : 08-NOV-2013  <b>No. of samples received</b> : 6 <b>No. of samples analysed</b> : 6
---	--

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

### *Signatories*

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ashesh Patel	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Raymond Commodor	Instrument Chemist	Sydney Inorganics



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EP080: Poor matrix spike recoveries due to matrix effects.confirmed by re-analysis.**
- **EP080: Sample TRIP SPIKE contains volatile compounds spiked into the sample containers prior to dispatch from the laboratory. BTEX compounds spiked at 20 ug/L.**
- **Total PAH reported as the sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene and Benzo(g,h,i)perylene.**



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				TE_MW5	TE_MW6	TE_MW7	TE_MW9	RB_GW2
				31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323608-001	ES1323608-002	ES1323608-003	ES1323608-004	ES1323608-005
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	87	31	258	53	<1
Total Alkalinity as CaCO3	----	1	mg/L	87	31	258	53	<1
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	176	107	244	83	<1
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	28	20	37	166	<1
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	33	4	105	29	<1
Magnesium	7439-95-4	1	mg/L	28	6	52	18	<1
Sodium	7440-23-5	1	mg/L	34	36	33	93	<1
Potassium	7440-09-7	1	mg/L	8	3	15	8	<1
<b>EG020F: Dissolved Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	0.004	0.002	0.022	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.002	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L	0.050	0.027	0.007	0.023	<0.001
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	7440-66-6	0.005	mg/L	0.070	0.080	0.014	0.025	<0.005
Manganese	7439-96-5	0.001	mg/L	2.96	2.48	0.145	1.84	<0.001
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Boron	7440-42-8	0.05	mg/L	0.14	0.10	0.06	<0.05	<0.05
Iron	7439-89-6	0.05	mg/L	12.2	23.0	<0.05	22.7	<0.05
<b>EG035F: Dissolved Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
<b>EK040P: Fluoride by PC Titrator</b>								
Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.3	<0.1	<0.1
<b>EN055: Ionic Balance</b>								
Total Anions	----	0.01	meq/L	6.19	3.41	11.3	7.47	<0.01
Total Cations	----	0.01	meq/L	----	----	11.3	7.18	<0.01
Total Cations	----	0.01	meq/L	6.28	3.52	----	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				TE_MW5	TE_MW6	TE_MW7	TE_MW9	RB_GW2
				31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323608-001	ES1323608-002	ES1323608-003	ES1323608-004	ES1323608-005
<b>EN055: Ionic Balance - Continued</b>								
Ionic Balance	----	0.01	%	----	----	0.27	1.99	----
Ionic Balance	----	0.01	%	0.68	1.53	----	----	----
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	1	µg/L	<1	<1	<1	<1	<1
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	5	µg/L	<5	<5	<5	<5	<5
Isopropylbenzene	98-82-8	5	µg/L	<5	<5	<5	<5	<5
n-Propylbenzene	103-65-1	5	µg/L	<5	<5	<5	<5	<5
1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	<5	<5	<5
sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	<5	<5	<5
1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	<5	<5	<5
tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	<5	<5	<5
p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	<5	<5	<5
n-Butylbenzene	104-51-8	5	µg/L	<5	<5	<5	<5	<5
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	50	µg/L	<50	<50	<50	<50	<50
2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	<50	<50	<50
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	<50	<50	<50
2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	<50	<50	<50
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	5	µg/L	<5	<5	<5	<5	<5
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	<5	<5	<5
1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	<5	<5	<5
cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	<5	<5	<5
trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	<5	<5	<5
1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	<5	<5	<5
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	<50	<50	<50
Chloromethane	74-87-3	50	µg/L	<50	<50	<50	<50	<50
Vinyl chloride	75-01-4	50	µg/L	<50	<50	<50	<50	<50
Bromomethane	74-83-9	50	µg/L	<50	<50	<50	<50	<50
Chloroethane	75-00-3	50	µg/L	<50	<50	<50	<50	<50



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				TE_MW5	TE_MW6	TE_MW7	TE_MW9	RB_GW2
				31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323608-001	ES1323608-002	ES1323608-003	ES1323608-004	ES1323608-005
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	<50	<50	<50
1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	<5	<5	<5
Iodomethane	74-88-4	5	µg/L	<5	<5	<5	<5	<5
trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	<5	<5	<5
1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	<5	<5	<5
cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	<5	<5	<5
1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	<5	<5	<5
1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	<5	<5	<5
Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	<5	<5	<5
1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	<5	<5	<5
Trichloroethene	79-01-6	5	µg/L	<5	<5	<5	<5	<5
Dibromomethane	74-95-3	5	µg/L	<5	<5	<5	<5	<5
1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	<5	<5	<5
1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	<5	<5	<5
Tetrachloroethene	127-18-4	5	µg/L	<5	<5	<5	<5	<5
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	<5	<5	<5
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	<5	<5	<5
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	<5	<5	<5
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	<5	<5	<5
1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	<5	<5	<5
Pentachloroethane	76-01-7	5	µg/L	<5	<5	<5	<5	<5
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	<5	<5	<5
Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	<5	<5	<5
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	5	µg/L	<5	<5	<5	<5	<5
Bromobenzene	108-86-1	5	µg/L	<5	<5	<5	<5	<5
2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	<5	<5	<5
4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	<5	<5	<5
1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	<5	<5	<5
1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	<5	<5	<5
1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	<5	<5	<5
1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	<5	<5	<5
1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	<5	<5	<5



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				TE_MW5	TE_MW6	TE_MW7	TE_MW9	RB_GW2
				31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323608-001	ES1323608-002	ES1323608-003	ES1323608-004	ES1323608-005
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	5	µg/L	<5	<5	<5	<5	<5
Bromodichloromethane	75-27-4	5	µg/L	<5	<5	<5	<5	<5
Dibromochloromethane	124-48-1	5	µg/L	<5	<5	<5	<5	<5
Bromoform	75-25-2	5	µg/L	<5	<5	<5	<5	<5
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	7	µg/L	<7	<7	<7	<7	<7
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5





## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				TE_MW5	TE_MW6	TE_MW7	TE_MW9	RB_GW2
				31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323608-001	ES1323608-002	ES1323608-003	ES1323608-004	ES1323608-005
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	92.7	86.8	74.9	92.1	72.0
<b>EP074S: VOC Surrogates</b>								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	119	122	122	119	127



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				TE_MW5	TE_MW6	TE_MW7	TE_MW9	RB_GW2
				31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323608-001	ES1323608-002	ES1323608-003	ES1323608-004	ES1323608-005
<b>EP074S: VOC Surrogates - Continued</b>								
Toluene-D8	2037-26-5	0.1	%	111	115	115	110	119
4-Bromofluorobenzene	460-00-4	0.1	%	105	110	112	108	112
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	40.8	35.2	26.9	34.1	32.5
2-Chlorophenol-D4	93951-73-6	0.1	%	79.8	69.6	53.5	67.4	63.5
2,4,6-Tribromophenol	118-79-6	0.1	%	108	97.8	77.4	91.4	79.4
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	85.1	76.6	62.1	77.2	72.4
Anthracene-d10	1719-06-8	0.1	%	94.8	83.8	72.3	83.6	76.4
4-Terphenyl-d14	1718-51-0	0.1	%	97.7	87.2	77.5	85.9	77.1
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	115	119	117	116	123
Toluene-D8	2037-26-5	0.1	%	105	110	109	104	113
4-Bromofluorobenzene	460-00-4	0.1	%	102	107	108	100	106



## Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Client sample ID

				TS	----	----	----	----
				25-OCT-2013 15:00	----	----	----	----
				ES1323608-006	----	----	----	----
Compound	CAS Number	LOR	Unit					
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	16	----	----	----	----
Toluene	108-88-3	2	µg/L	15	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	14	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	15	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	15	----	----	----	----
^ Total Xylenes	1330-20-7	2	µg/L	30	----	----	----	----
^ Sum of BTEX	----	1	µg/L	75	----	----	----	----
Naphthalene	91-20-3	5	µg/L	17	----	----	----	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	114	----	----	----	----
Toluene-D8	2037-26-5	0.1	%	121	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	113	----	----	----	----



## Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP066S: PCB Surrogate</b>			
Decachlorobiphenyl	2051-24-3	28.5	129
<b>EP074S: VOC Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	78.3	133.2
Toluene-D8	2037-26-5	79.1	128.9
4-Bromofluorobenzene	460-00-4	80.8	123.7
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	10.0	44
2-Chlorophenol-D4	93951-73-6	14	94
2,4,6-Tribromophenol	118-79-6	17	125
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27.4	113
4-Terphenyl-d14	1718-51-0	32	112
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: ES1323608</b>	<b>Page</b>	: 1 of 16
<b>Client</b>	<b>: ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: MR JONATHAN LEKAWSKI	<b>Contact</b>	: Barbara Hanna
<b>Address</b>	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: jonathan.lekawski@erm.com	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: WALLERAWANG MT PIPER GW	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b>	: ----	<b>Date Samples Received</b>	: 01-NOV-2013
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: 08-NOV-2013
<b>Sampler</b>	: D.B/S.H	<b>No. of samples received</b>	: 6
<b>Order number</b>	: 0207423/0207420	<b>No. of samples analysed</b>	: 6
<b>Quote number</b>	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

### *Signatories*

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ashesh Patel	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Raymond Commodor	Instrument Chemist	Sydney Inorganics



### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :  
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
RPD = Relative Percentage Difference  
# = Indicates failed QC





## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>ED037P: Alkalinity by PC Titrator (QC Lot: 3140540)</b>									
ES1323471-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	64	64	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	64	64	0.0	0% - 20%
ES1323475-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	126	124	1.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	126	124	1.7	0% - 20%
<b>ED037P: Alkalinity by PC Titrator (QC Lot: 3140543)</b>									
ES1323608-003	TE_MW7	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	258	257	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	258	257	0.0	0% - 20%
ES1323626-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	7	6	0.0	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	7	6	0.0	No Limit
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3140913)</b>									
ES1323608-001	TE_MW5	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	176	168	4.8	0% - 20%
ES1323712-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	21	19	8.4	0% - 20%
<b>ED045G: Chloride Discrete analyser (QC Lot: 3140912)</b>									
ES1323608-001	TE_MW5	ED045G: Chloride	16887-00-6	1	mg/L	28	32	14.1	0% - 20%
ES1323776-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	<1	<1	0.0	No Limit
<b>ED093F: Dissolved Major Cations (QC Lot: 3140911)</b>									
ES1323608-001	TE_MW5	ED093F: Calcium	7440-70-2	1	mg/L	33	34	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	28	28	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	34	34	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	8	8	0.0	No Limit
ES1323820-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	17	15	11.9	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	5	5	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	27	25	7.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	1	1	0.0	No Limit
<b>EG020F: Dissolved Metals by ICP-MS (QC Lot: 3139270)</b>									
ES1323472-003	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0318	0.0318	0.0	0% - 20%
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG020F: Dissolved Metals by ICP-MS (QC Lot: 3139270) - continued</b>									
ES1323472-003	Anonymous	EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.018	0.017	0.0	0% - 50%
		EG020A-F: Lead	7439-92-1	0.001	mg/L	0.138	0.137	0.8	0% - 20%
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	1.29	1.27	1.9	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.033	0.033	0.0	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	3.31	3.22	2.4	0% - 20%
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	0.16	0.15	0.0	No Limit
ES1323606-001	Anonymous	EG020A-F: Iron	7439-89-6	0.05	mg/L	0.06	<0.05	22.1	No Limit
		EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0001	0.0002	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.011	0.011	0.0	0% - 50%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.011	0.012	0.0	0% - 50%
		EG020A-F: Lead	7439-92-1	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.011	0.011	0.0	0% - 50%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.142	0.147	3.6	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.041	0.044	6.7	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	0.11	0.12	0.0	No Limit
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit		
<b>EG035F: Dissolved Mercury by FIMS (QC Lot: 3139269)</b>									
ES1323472-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1323472-011	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
<b>EK040P: Fluoride by PC Titrator (QC Lot: 3140542)</b>									
ES1323475-001	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.2	0.2	0.0	No Limit
ES1323608-003	TE_MW7	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.3	0.4	0.0	No Limit
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3141200)</b>									
ES1323548-001	Anonymous	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
ES1323609-001	Anonymous	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3141200) - continued</b>									
ES1323609-001	Anonymous	EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
<b>EP074B: Oxygenated Compounds (QC Lot: 3141200)</b>									
ES1323548-001	Anonymous	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
ES1323609-001	Anonymous	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
<b>EP074C: Sulfonated Compounds (QC Lot: 3141200)</b>									
ES1323548-001	Anonymous	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
ES1323609-001	Anonymous	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
<b>EP074D: Fumigants (QC Lot: 3141200)</b>									
ES1323548-001	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
ES1323609-001	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3141200)</b>									
ES1323548-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3141200) - continued</b>									
ES1323548-001	Anonymous	EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit		
ES1323609-001	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report							
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)		
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3141200) - continued</b>											
ES1323609-001	Anonymous	EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit		
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit		
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit		
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit		
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3141200)</b>											
ES1323548-001	Anonymous	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit		
ES1323609-001	Anonymous	EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit		
ES1323609-001	Anonymous	EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit		
		<b>EP074G: Trihalomethanes (QC Lot: 3141200)</b>									
		ES1323548-001	Anonymous	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
				EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
				EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
				EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
		ES1323609-001	Anonymous	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
EP074: Bromodichloromethane	75-27-4			5	µg/L	<5	<5	0.0	No Limit		
EP074: Dibromochloromethane	124-48-1			5	µg/L	<5	<5	0.0	No Limit		
EP074: Bromoform	75-25-2			5	µg/L	<5	<5	0.0	No Limit		
<b>EP074H: Naphthalene (QC Lot: 3141200)</b>											
ES1323548-001	Anonymous	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit		
ES1323609-001	Anonymous	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit		
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3141201)</b>											
ES1323548-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit		
ES1323609-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	20	20	0.0	No Limit		
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3141201)</b>											



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3141201) - continued</b>									
ES1323548-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES1323609-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	30	30	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3141201)</b>									
ES1323548-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES1323609-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	3	3	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3142315)</b>									
ES1323549-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES1323684-004	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit





### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%)		
						LCS	Low	High
<b>ED037P: Alkalinity by PC Titrator (QCLot: 3140540)</b>								
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	----	200 mg/L	94.6	81	111
<b>ED037P: Alkalinity by PC Titrator (QCLot: 3140543)</b>								
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	----	200 mg/L	90.3	81	111
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3140913)</b>								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	117	86	122
<b>ED045G: Chloride Discrete analyser (QCLot: 3140912)</b>								
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	92.7	77	123
<b>ED093F: Dissolved Major Cations (QCLot: 3140911)</b>								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	96.4	87	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	96.6	89	113
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	93.2	79	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	94.2	87	115
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3139270)</b>								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	104	80	118
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	102	82	112
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	99.7	81	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	98.8	80	112
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	105	83	111
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	100	81	113
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	103	81	113
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	110	73	125
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	97.3	80	116
EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.1 mg/L	105	69	123
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	97.2	77	115
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3139269)</b>								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	91.7	78	114
<b>EK040P: Fluoride by PC Titrator (QCLot: 3140542)</b>								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5.0 mg/L	93.4	75	119
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3138111)</b>								
EP066: Total Polychlorinated biphenyls	----	1	µg/L	<1	10 µg/L	85.0	61.6	107
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3141200)</b>								
EP074: Styrene	100-42-5	5	µg/L	<5	10 µg/L	91.6	74	118
EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	10 µg/L	99.2	75	121



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3141200) - continued</b>									
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	10 µg/L	104	67	123	
EP074: 1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	10 µg/L	103	70	122	
EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	10 µg/L	102	69	123	
EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	10 µg/L	104	71	121	
EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	10 µg/L	98.0	70	122	
EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	10 µg/L	103	67	123	
EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	10 µg/L	100	62	126	
<b>EP074B: Oxygenated Compounds (QCLot: 3141200)</b>									
EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	100 µg/L	106	61.4	134	
EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	100 µg/L	102	73.6	130	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	100 µg/L	106	61	139	
EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	100 µg/L	102	65	137	
<b>EP074C: Sulfonated Compounds (QCLot: 3141200)</b>									
EP074: Carbon disulfide	75-15-0	5	µg/L	<5	10 µg/L	92.1	72.8	127	
<b>EP074D: Fumigants (QCLot: 3141200)</b>									
EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	10 µg/L	100	61	119	
EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	10 µg/L	111	76	120	
EP074: cis-1,3-Dichloropropylene	10061-01-5	10	µg/L	<10	10 µg/L	94.9	62	120	
EP074: trans-1,3-Dichloropropylene	10061-02-6	10	µg/L	<10	10 µg/L	87.9	61	119	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	10 µg/L	101	69	117	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3141200)</b>									
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	100 µg/L	97.2	60.6	138	
EP074: Chloromethane	74-87-3	50	µg/L	<50	100 µg/L	106	67.4	130	
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	100 µg/L	108	69.4	129	
EP074: Bromomethane	74-83-9	50	µg/L	<50	100 µg/L	112	56	140	
EP074: Chloroethane	75-00-3	50	µg/L	<50	100 µg/L	114	63	135	
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	100 µg/L	104	65	131	
EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	10 µg/L	99.0	69	123	
EP074: Iodomethane	74-88-4	5	µg/L	<5	10 µg/L	101	70.2	128	
EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	10 µg/L	108	71	119	
EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	10 µg/L	100	75	119	
EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	10 µg/L	111	77	117	
EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	10 µg/L	98.6	61	119	
EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	10 µg/L	103	73	119	
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	10 µg/L	92.2	63	121	
EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	10 µg/L	106	78	122	
EP074: Trichloroethene	79-01-6	5	µg/L	<5	10 µg/L	108	74	120	
EP074: Dibromomethane	74-95-3	5	µg/L	<5	10 µg/L	102	74	118	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3141200) - continued</b>									
EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	10 µg/L	92.4	75	123	
EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	10 µg/L	105	79	121	
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	10 µg/L	101	72	124	
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	10 µg/L	91.0	66	114	
EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	10 µg/L	87.9	60	120	
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	10 µg/L	93.6	70.6	128	
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	10 µg/L	96.6	70	124	
EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	10 µg/L	100	74	128	
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	10 µg/L	86.5	71.8	126	
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	10 µg/L	95.0	66.4	136	
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	10 µg/L	110	58	132	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3141200)</b>									
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	10 µg/L	103	80	118	
EP074: Bromobenzene	108-86-1	5	µg/L	<5	10 µg/L	103	76	116	
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	10 µg/L	95.0	71	121	
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	10 µg/L	106	71	121	
EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	10 µg/L	107	74	120	
EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	10 µg/L	107	72	120	
EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	10 µg/L	102	77	117	
EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	10 µg/L	102	60	126	
EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	10 µg/L	104	67	125	
<b>EP074G: Trihalomethanes (QCLot: 3141200)</b>									
EP074: Chloroform	67-66-3	5	µg/L	<5	10 µg/L	109	76	118	
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	10 µg/L	93.4	64	118	
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	10 µg/L	78.6	65	115	
EP074: Bromoform	75-25-2	5	µg/L	<5	10 µg/L	80.0	73.5	126	
<b>EP074H: Naphthalene (QCLot: 3141200)</b>									
EP074: Naphthalene	91-20-3	7	µg/L	<7	10 µg/L	90.4	61	125	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3138113)</b>									
EP075(SIM): Phenol	108-95-2	0.2	µg/L	----	5 µg/L	47.3	24.5	61.9	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Chlorophenol	95-57-8	0.2	µg/L	----	5 µg/L	74.9	63.8	110	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Methylphenol	95-48-7	0.2	µg/L	----	5 µg/L	72.8	55.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	0.4	µg/L	----	10 µg/L	75.9	42.5	114	
		2	µg/L	<2.0	----	----	----	----	
EP075(SIM): 2-Nitrophenol	88-75-5	0.2	µg/L	----	5 µg/L	74.8	62.7	117	
		1	µg/L	<1.0	----	----	----	----	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3138113) - continued</b>									
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.2	µg/L	----	5 µg/L	71.2	59.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.2	µg/L	----	5 µg/L	74.0	59.3	122	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.2	µg/L	----	5 µg/L	73.3	64.3	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.2	µg/L	----	5 µg/L	73.6	63	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.2	µg/L	----	5 µg/L	69.1	58.7	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.2	µg/L	----	5 µg/L	74.1	50	108	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Pentachlorophenol	87-86-5	0.4	µg/L	----	10 µg/L	93.7	8.7	95	
		2	µg/L	<2.0	----	----	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3138113)</b>									
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	5 µg/L	65.1	58.6	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	5 µg/L	68.0	63.6	114	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	5 µg/L	67.2	62.2	113	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	5 µg/L	73.7	63.9	115	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	5 µg/L	89.4	62.6	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	5 µg/L	90.6	64.3	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	5 µg/L	110	63.6	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	5 µg/L	112	63.1	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	5 µg/L	106	64.1	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	5 µg/L	104	62.5	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	5 µg/L	104	61.7	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	5 µg/L	102	61.7	117	
		1	µg/L	<1.0	----	----	----	----	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3138113) - continued</b>									
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	5 µg/L	107	63.3	117	
		0.5	µg/L	<0.5	----	----	----	----	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	5 µg/L	107	59.9	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	----	5 µg/L	110	61.2	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	----	5 µg/L	105	59.1	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	1	µg/L	<1.0	----	----	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3138112)</b>									
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	95.7	59	129	
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	94.5	71	131	
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	93.9	62	120	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3141201)</b>									
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	104	75	127	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3138112)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	2500 µg/L	98.1	58.9	131	
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	91.8	73.9	138	
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----	
		50	µg/L	----	1500 µg/L	104	67	127	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3141201)</b>									
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	106	75	127	
<b>EP080: BTEXN (QCLot: 3141201)</b>									
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	103	70	124	
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	113	65	129	
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	105	70	120	
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	102	69	121	
	106-42-3								
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	107	72	122	
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	105	70	124	
<b>EP080: BTEXN (QCLot: 3142315)</b>									
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	90.2	70	124	
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	90.7	65	129	
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	87.4	70	120	
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	88.6	69	121	
	106-42-3								
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	87.9	72	122	
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	86.4	70	124	



## Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Concentration	Spike Recovery(%) MS	Recovery Limits (%) Low High	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3140913)</b>							
ES1323608-001	TE_MW5	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130
<b>ED045G: Chloride Discrete analyser (QCLot: 3140912)</b>							
ES1323608-001	TE_MW5	ED045G: Chloride	16887-00-6	250 mg/L	89.0	70	130
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3139270)</b>							
ES1323472-004	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	115	70	130
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	# Not Determined	70	130
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	111	70	130
		EG020A-F: Copper	7440-50-8	0.2 mg/L	112	70	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	104	70	130
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	# Not Determined	70	130
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	101	70	130
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	# Not Determined	70	130
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3139269)</b>							
ES1323472-002	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	81.6	70	130
<b>EK040P: Fluoride by PC Titrator (QCLot: 3140542)</b>							
ES1323475-001	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	91.6	70	130
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3141200)</b>							
ES1323548-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	25 µg/L	122	70	130
		EP074: Trichloroethene	79-01-6	25 µg/L	110	70	130
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3141200)</b>							
ES1323548-001	Anonymous	EP074: Chlorobenzene	108-90-7	25 µg/L	112	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3141201)</b>							
ES1323548-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	113	70	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3141201)</b>							
ES1323548-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	114	70	130
<b>EP080: BTEXN (QCLot: 3141201)</b>							
ES1323548-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	93.0	70	130
		EP080: Toluene	108-88-3	25 µg/L	104	70	130





Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EP080: BTEXN (QCLot: 3141201) - continued</b>							
ES1323548-001	Anonymous	EP080: Ethylbenzene	100-41-4	25 µg/L	104	70	130
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	105	70	130
		106-42-3					
		EP080: ortho-Xylene	95-47-6	25 µg/L	104	70	130
		EP080: Naphthalene	91-20-3	25 µg/L	98.3	70	130
<b>EP080: BTEXN (QCLot: 3142315)</b>							
ES1323549-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	95.3	70	130
		EP080: Toluene	108-88-3	25 µg/L	95.8	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	97.9	70	130
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	# 45.2	70	130
		106-42-3					
		EP080: ortho-Xylene	95-47-6	25 µg/L	90.8	70	130
		EP080: Naphthalene	91-20-3	25 µg/L	# 18.7	70	130

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3139269)</b>										
ES1323472-002	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	81.6	----	70	130	----	----
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3139270)</b>										
ES1323472-004	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	115	----	70	130	----	----
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	# Not Determined	----	70	130	----	----
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	111	----	70	130	----	----
		EG020A-F: Copper	7440-50-8	0.2 mg/L	112	----	70	130	----	----
		EG020A-F: Lead	7439-92-1	0.2 mg/L	104	----	70	130	----	----
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	# Not Determined	----	70	130	----	----
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	101	----	70	130	----	----
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	# Not Determined	----	70	130	----	----
<b>EK040P: Fluoride by PC Titrator (QCLot: 3140542)</b>										
ES1323475-001	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	91.6	----	70	130	----	----
<b>ED045G: Chloride Discrete analyser (QCLot: 3140912)</b>										



Sub-Matrix: **WATER**

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
					MS	MSD	Low	High	Value	Control Limit	
<b>ED045G: Chloride Discrete analyser (QCLot: 3140912) - continued</b>											
ES1323608-001	TE_MW5	ED045G: Chloride	16887-00-6	250 mg/L	89.0	----	70	130	----	----	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3140913)</b>											
ES1323608-001	TE_MW5	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	----	70	130	----	----	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3141200)</b>											
ES1323548-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	25 µg/L	122	----	70	130	----	----	
		EP074: Trichloroethene	79-01-6	25 µg/L	110	----	70	130	----	----	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3141200)</b>											
ES1323548-001	Anonymous	EP074: Chlorobenzene	108-90-7	25 µg/L	112	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3141201)</b>											
ES1323548-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	113	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3141201)</b>											
ES1323548-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	114	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3141201)</b>											
ES1323548-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	93.0	----	70	130	----	----	
		EP080: Toluene	108-88-3	25 µg/L	104	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	25 µg/L	104	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	105	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	25 µg/L	104	----	70	130	----	----	
		EP080: Naphthalene	91-20-3	25 µg/L	98.3	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3142315)</b>											
ES1323549-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	95.3	----	70	130	----	----	
		EP080: Toluene	108-88-3	25 µg/L	95.8	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	25 µg/L	97.9	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	# 45.2	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	25 µg/L	90.8	----	70	130	----	----	
		EP080: Naphthalene	91-20-3	25 µg/L	# 18.7	----	70	130	----	----	

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1323608</b>	Page	: 1 of 9
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: WALLERAWANG MT PIPER GW	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 01-NOV-2013
C-O-C number	: ----	Issue Date	: 08-NOV-2013
Sampler	: D.B/S.H	No. of samples received	: 6
Order number	: 0207423/0207420	No. of samples analysed	: 6
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER** Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>ED037P: Alkalinity by PC Titrator</b>								
Clear Plastic Bottle - Natural (ED037-P) TE_MW5, TE_MW7, RB_GW2	TE_MW6, TE_MW9,	31-OCT-2013	---	14-NOV-2013	----	04-NOV-2013	14-NOV-2013	✓
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Clear Plastic Bottle - Natural (ED041G) TE_MW5, TE_MW7, RB_GW2	TE_MW6, TE_MW9,	31-OCT-2013	---	28-NOV-2013	----	04-NOV-2013	28-NOV-2013	✓
<b>ED045G: Chloride Discrete analyser</b>								
Clear Plastic Bottle - Natural (ED045G) TE_MW5, TE_MW7, RB_GW2	TE_MW6, TE_MW9,	31-OCT-2013	---	28-NOV-2013	----	04-NOV-2013	28-NOV-2013	✓
<b>ED093F: Dissolved Major Cations</b>								
Clear Plastic Bottle - Natural (ED093F) TE_MW5, TE_MW7, RB_GW2	TE_MW6, TE_MW9,	31-OCT-2013	---	07-NOV-2013	----	04-NOV-2013	07-NOV-2013	✓
<b>EG020F: Dissolved Metals by ICP-MS</b>								
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) TE_MW5, TE_MW7, RB_GW2	TE_MW6, TE_MW9,	31-OCT-2013	---	29-APR-2014	----	04-NOV-2013	29-APR-2014	✓
<b>EG035F: Dissolved Mercury by FIMS</b>								
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) TE_MW5, TE_MW7, RB_GW2	TE_MW6, TE_MW9,	31-OCT-2013	---	28-NOV-2013	----	05-NOV-2013	28-NOV-2013	✓



Matrix: **WATER** Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EK040P: Fluoride by PC Titrator</b>								
<b>Clear Plastic Bottle - Natural (EK040P)</b> TE_MW5, TE_MW7, RB_GW2	TE_MW6, TE_MW9	31-OCT-2013	---	28-NOV-2013	----	04-NOV-2013	28-NOV-2013	✓
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
<b>Amber Glass Bottle - Unpreserved (EP066)</b> TE_MW5, TE_MW7, RB_GW2	TE_MW6, TE_MW9	31-OCT-2013	05-NOV-2013	07-NOV-2013	✓	05-NOV-2013	15-DEC-2013	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
<b>Amber Glass Bottle - Unpreserved (EP071)</b> TE_MW5, TE_MW7, RB_GW2	TE_MW6, TE_MW9	31-OCT-2013	05-NOV-2013	07-NOV-2013	✓	05-NOV-2013	15-DEC-2013	✓
<b>EP074D: Fumigants</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> TE_MW5, TE_MW7, RB_GW2	TE_MW6, TE_MW9	31-OCT-2013	05-NOV-2013	14-NOV-2013	✓	05-NOV-2013	14-NOV-2013	✓
<b>EP074E: Halogenated Aliphatic Compounds</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> TE_MW5, TE_MW7, RB_GW2	TE_MW6, TE_MW9	31-OCT-2013	05-NOV-2013	14-NOV-2013	✓	05-NOV-2013	14-NOV-2013	✓
<b>EP074F: Halogenated Aromatic Compounds</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> TE_MW5, TE_MW7, RB_GW2	TE_MW6, TE_MW9	31-OCT-2013	05-NOV-2013	14-NOV-2013	✓	05-NOV-2013	14-NOV-2013	✓
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> TE_MW5, TE_MW7, RB_GW2	TE_MW6, TE_MW9	31-OCT-2013	05-NOV-2013	14-NOV-2013	✓	05-NOV-2013	14-NOV-2013	✓
<b>EP074H: Naphthalene</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> TE_MW5, TE_MW7, RB_GW2	TE_MW6, TE_MW9	31-OCT-2013	05-NOV-2013	14-NOV-2013	✓	05-NOV-2013	14-NOV-2013	✓



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP074B: Oxygenated Compounds</b>							
Amber VOC Vial - Sulfuric Acid (EP074) TE_MW5, TE_MW7, RB_GW2 TE_MW6, TE_MW9	31-OCT-2013	05-NOV-2013	14-NOV-2013	✓	05-NOV-2013	14-NOV-2013	✓
<b>EP074C: Sulfonated Compounds</b>							
Amber VOC Vial - Sulfuric Acid (EP074) TE_MW5, TE_MW7, RB_GW2 TE_MW6, TE_MW9	31-OCT-2013	05-NOV-2013	14-NOV-2013	✓	05-NOV-2013	14-NOV-2013	✓
<b>EP074G: Trihalomethanes</b>							
Amber VOC Vial - Sulfuric Acid (EP074) TE_MW5, TE_MW7, RB_GW2 TE_MW6, TE_MW9	31-OCT-2013	05-NOV-2013	14-NOV-2013	✓	05-NOV-2013	14-NOV-2013	✓
<b>EP075(SIM)A: Phenolic Compounds</b>							
Amber Glass Bottle - Unpreserved (EP075(SIM)) TE_MW5, TE_MW7, RB_GW2 TE_MW6, TE_MW9	31-OCT-2013	05-NOV-2013	07-NOV-2013	✓	05-NOV-2013	15-DEC-2013	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>							
Amber Glass Bottle - Unpreserved (EP075(SIM)) TE_MW5, TE_MW7, RB_GW2 TE_MW6, TE_MW9	31-OCT-2013	05-NOV-2013	07-NOV-2013	✓	05-NOV-2013	15-DEC-2013	✓
<b>EP080: BTEXN</b>							
Amber VOC Vial - Sulfuric Acid (EP080) TS	25-OCT-2013	05-NOV-2013	08-NOV-2013	✓	05-NOV-2013	08-NOV-2013	✓
Amber VOC Vial - Sulfuric Acid (EP080) TE_MW5, TE_MW7, RB_GW2 TE_MW6, TE_MW9	31-OCT-2013	05-NOV-2013	14-NOV-2013	✓	05-NOV-2013	14-NOV-2013	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>							
Amber VOC Vial - Sulfuric Acid (EP080) TE_MW5, TE_MW7, RB_GW2 TE_MW6, TE_MW9	31-OCT-2013	05-NOV-2013	14-NOV-2013	✓	05-NOV-2013	14-NOV-2013	✓





## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Reaular	Actual	Expected	Evaluation	
<b>Laboratory Duplicates (DUP)</b>							
Alkalinity by PC Titrator	ED037-P	4	37	10.8	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	13	15.4	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	15	13.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	4	39	10.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
Alkalinity by PC Titrator	ED037-P	2	37	5.4	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	13	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	10	10.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	9	11.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	15	6.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	15	6.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	39	5.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
Chloride by Discrete Analyser	ED045G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	13	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	10	10.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	9	11.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	15	6.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	15	6.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	39	5.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
Chloride by Discrete Analyser	ED045G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



Matrix: **WATER** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Matrix Spikes (MS) - Continued</b>							
Dissolved Mercury by FIMS	EG035F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	15	6.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	39	5.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Sulfate (Turbidimetric) as SO <sub>4</sub> <sup>2-</sup> by Discrete Analyser	ED041G	WATER	APHA 21st ed., 4500-SO <sub>4</sub> Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> <sup>2-</sup> concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Chloride by Discrete Analyser	ED045G	WATER	APHA 21st ed., 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	Major Cations is determined based on APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um filtered sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Hardness parameters are calculated based on APHA 21st ed., 2340 B. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): Samples are 0.45 um filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) Samples are 0.45 um filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Fluoride by PC Titrator	EK040P	WATER	APHA 21st ed., 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Ionic Balance by PCT DA and Turbi SO <sub>4</sub> DA	EN055 - PG	WATER	APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by Turbi SO <sub>4</sub> by DA. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)



Analytical Methods	Method	Matrix	Method Descriptions
Polychlorinated Biphenyls (PCB)	EP066	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
TPH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Volatile Organic Compounds	EP074	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
TPH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
Separatory Funnel Extraction of Liquids	ORG14	WATER	USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.



## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Matrix Spike (MS) Recoveries</b>							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	ES1323608-001	TE_MW5	Sulfate as SO4 - Turbidimetric	14808-79-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG020F: Dissolved Metals by ICP-MS	ES1323472-004	Anonymous	Cadmium	7440-43-9	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG020F: Dissolved Metals by ICP-MS	ES1323472-004	Anonymous	Manganese	7439-96-5	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG020F: Dissolved Metals by ICP-MS	ES1323472-004	Anonymous	Zinc	7440-66-6	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP080: BTEXN	ES1323549-001	Anonymous	meta- & para-Xylene	108-38-3 106-42-3	45.2 %	70-130%	Recovery less than lower data quality objective
EP080: BTEXN	ES1323549-001	Anonymous	Naphthalene	91-20-3	18.7 %	70-130%	Recovery less than lower data quality objective

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.

#### Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- No Analysis Holding Time Outliers exist.

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

<b>Work Order</b>	<b>: ES1323608</b>		
<b>Client</b>	<b>: ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	<b>: Environmental Division Sydney</b>
<b>Contact Address</b>	<b>: MR JONATHAN LEKAWSKI 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007</b>	<b>Contact Address</b>	<b>: Barbara Hanna 277-289 Woodpark Road Smithfield NSW Australia 2164</b>
<b>E-mail</b>	<b>: jonathan.lekawski@erm.com</b>	<b>E-mail</b>	<b>: Barbara.Hanna@alsglobal.com</b>
<b>Telephone</b>	<b>: +61 02 8584 8888</b>	<b>Telephone</b>	<b>: +61 2 8784 8555</b>
<b>Facsimile</b>	<b>: +61 02 8584 8800</b>	<b>Facsimile</b>	<b>: +61 2 8784 8555</b>
<b>Project</b>	<b>: WALLERAWANG MT PIPER GW</b>	<b>Page</b>	<b>: 1 of 3</b>
<b>Order number</b>	<b>: 0207423/0207420</b>	<b>Quote number</b>	<b>: ES2013ENVRES0370 (SY/278/13 V3)</b>
<b>C-O-C number</b>	<b>: ----</b>	<b>QC Level</b>	<b>: NEPM 2013 Schedule B(3) and ALS QCS3 requirement</b>
<b>Site</b>	<b>: ----</b>		
<b>Sampler</b>	<b>: D.B/S.H</b>		

#### Dates

<b>Date Samples Received</b>	<b>: 01-NOV-2013</b>	<b>Issue Date</b>	<b>: 01-NOV-2013 16:34</b>
<b>Client Requested Due Date</b>	<b>: 08-NOV-2013</b>	<b>Scheduled Reporting Date</b>	<b>: 08-NOV-2013</b>

#### Delivery Details

<b>Mode of Delivery</b>	<b>: Carrier</b>	<b>Temperature</b>	<b>: 5.1°C - Ice present</b>
<b>No. of coolers/boxes</b>	<b>: 1 HARD</b>	<b>No. of samples received</b>	<b>: 6</b>
<b>Security Seal</b>	<b>: Intact.</b>	<b>No. of samples analysed</b>	<b>: 6</b>

#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Due to limited volume , PAH and Phenol analysis will conduct as standard LOR, Please confirm**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.





## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EG020F Dissolved Metals by ICPMS	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP066-PCB-WA Polychlorinated Biphenyls (PCB)	WATER - EP074 (water) Volatile Organic Compounds	WATER - EP080 BTEXN	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02A Major Anions (Chloride, Sulphate, Fluoride,	WATER - W-05 TRH/BTEXN/8 Metals
ES1323608-001	31-OCT-2013 15:00	TE_MW5	✓	✓	✓	✓		✓	✓	✓
ES1323608-002	31-OCT-2013 15:00	TE_MW6	✓	✓	✓	✓		✓	✓	✓
ES1323608-003	31-OCT-2013 15:00	TE_MW7	✓	✓	✓	✓		✓	✓	✓
ES1323608-004	31-OCT-2013 15:00	TE_MW9	✓	✓	✓	✓		✓	✓	✓
ES1323608-005	31-OCT-2013 15:00	RB_GW2	✓	✓	✓	✓		✓	✓	✓
ES1323608-006	25-OCT-2013 15:00	TS					✓			

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - W-14A PAH/Phenols (SIM)
ES1323608-001	31-OCT-2013 15:00	TE_MW5	✓
ES1323608-002	31-OCT-2013 15:00	TE_MW6	✓
ES1323608-003	31-OCT-2013 15:00	TE_MW7	✓
ES1323608-004	31-OCT-2013 15:00	TE_MW9	✓
ES1323608-005	31-OCT-2013 15:00	RB_GW2	✓

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
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Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com



**CHAIN OF CUSTODY**

DADELAIDE 21 Burma Road Poraka SA 5095  
Ph: 08 8250 0900 E: ade@als.com.au  
DORSET 20 Edward Street Sturtford QLD 4053  
Ph: 07 3217 2222 E: samples.dorset@als.com.au  
CULBERTSON 36 Callenonah Drive Clinton QLD 4680  
Ph: 07 7471 5000 E: glenn@als.com.au

DIMACKAY 78 Harbour Road Mackay QLD 4740  
Ph: 07 4944 0177 E: mackay@als.com.au  
DINELBOURNE 2-4 Westall Road Springvale VIC 3171  
Ph: 03 8549 6000 E: samples.melbourne@als.com.au  
DUNDEE 27 Sydney Road Mudgee NSW 2850  
Ph: 02 6372 6725 E: mudgee@als.com.au

DUNCASTLE 5 Ross Gum Road Warbrook NSW 2304  
Ph: 02 4658 9433 E: samples.newcastle@als.com.au  
DUNDEE 4/13 Geary Place North Nowra NSW 2541  
Ph: 024423 2083 E: nowra@als.com.au  
DUPERTH 10 Hod Way Malaga WA 6060  
Ph: 08 9206 7655 E: samples.perth@als.com.au

DUNEDIN 277-289 Woodpark Road Smithfield NSW 2164  
Ph: 02 8784 8555 E: samples.sydney@als.com.au  
DUNEDIN 14-15 Darra Court Borella QLD 4818  
Ph: 07 4766 6000 E: boravilla.environment@als.com.au  
DUNEDIN 99 Kenny Street Wollombong NSW 2500  
Ph: 02 4223 9125 E: wollombong@als.com.au

**CLIENT:** ERM  
**OFFICE:** GROUND FLOOR, 33 SAUNDERS ST, PYRMONT NSW 2009  
**PROJECT:** Wallerawang/M1 Piper GW  
**ORDER NUMBER:** 0207423/0207420  
**CONTACT PH:**  
**PROJECT MANAGER:** Jonathan Lekawski  
**SAMPLER:** Dana Brookes/Skye Holloman  
**COC emailed to ALS?** ( YES  NO  )  
**EDD FORMAT (or default):** PDF/CSV/SDAT  
**Email Reports to (will default to PM if no other addresses are listed):** Symphony.DeltaWest@erm.com  
**Email Invoice to (will default to PM if no other addresses are listed):** Symphony.DeltaWest@erm.com

**TURNAROUND REQUIREMENTS:**  
 Standard TAT (List due date):  
 Non Standard or urgent TAT (List due date):  
**ALS QUOTE NO.:** SY/278113 **EAM 0194708**  
**RECEIVED BY:** David  
**DATE/TIME:** 1/11 0800  
**RELINQUISHED BY:** Skye Holloman  
**DATE/TIME:** 31/10/13

**COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:**

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below	TOTAL CONTAINERS	ANALYSIS REQUIRED INCLUDING SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).													Additional Information
						W4 (TPH/TRH (C-G))	W2 - Dissolved Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg) - W-2	E6020F - Additional Metals - Se, B, Fe, Mn	UTO-SW Phenols and PAH - Ultra Trace	VOC Scan	Cations - NT-1	Anions (incl F-) - NT-2A	PCB	Comments on likely contaminant levels, dilutions, or samples requiring specific CC analysis etc.					
1	TE-MWS	31/10/13	W	VS, N, P, H, AG	6	X	X	X	X	X	X	X	X	X	X	X	X		
2	TE-MW6				6	X	X	X	X	X	X	X	X	X	X	X	X		
3	TE-MW7				6	X	X	X	X	X	X	X	X	X	X	X	X		
4	TE-MW9				6	X	X	X	X	X	X	X	X	X	X	X	X		
5	RB-GW2	31/10/13	W	VS, N, P, H, AG	6	X	X	X	X	X	X	X	X	X	X	X	X		
6	TS	25/10/13	W	VS	62	X	X	X	X	X	X	X	X	X	X	X	X		

**Environmental Division Sydney Work Order ES1323608**  
Telephone : +61-2-8784 8555  
Environmental Division Sydney Work Order ES1323608  
Barcode  
Telephone : +61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass L  
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Plastic; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;  
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>ES1323856</b> <b>Amendment</b> : <b>2</b> <b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : <b>MR JONATHAN LEKAWSKI</b> <b>Address</b> : <b>GROUND FLOOR</b> <b>33 SAUNDERS STREET, PYRMONT NSW 2009</b> <b>LOCKED BAG 24</b> <b>BROADWAY NSW, AUSTRALIA 2007</b>  <b>E-mail</b> : jonathan.lekawski@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800 <b>Project</b> : WALLERAWANG MT PIPER GW <b>Order number</b> : 0207423/0207420 <b>C-O-C number</b> : ---- <b>Sampler</b> : DB,SH <b>Site</b> : ----  <b>Quote number</b> : SY/278/13 V3	<b>Page</b> : 1 of 18  <b>Laboratory</b> : Environmental Division Sydney <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164  <b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555 <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement  <b>Date Samples Received</b> : 05-NOV-2013 <b>Issue Date</b> : 28-JAN-2014  <b>No. of samples received</b> : 14 <b>No. of samples analysed</b> : 14
---	--

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ashesh Patel	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Hoa Nguyen	Senior Inorganic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EP080: Sample TRIP SPIKE contains volatile compounds spiked into the sample containers prior to dispatch from the laboratory. BTEX compounds spiked at 20 ug/L.**
- **Total PAH reported as the sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene and Benzo(g,h,i)perylene.**



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MI_X_5/D2	MI_X_5/D3	MJ_X_MWMP4	MJ_X_MWMP05	MJ_X_MWMP06
				31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323856-001	ES1323856-002	ES1323856-003	ES1323856-004	ES1323856-005
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	80	145	62	270	210
Total Alkalinity as CaCO3	----	1	mg/L	80	145	62	270	210
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	528	255	22	47	146
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	11	33	4	42	43
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	85	48	11	35	36
Magnesium	7439-95-4	1	mg/L	77	54	4	26	35
Sodium	7440-23-5	1	mg/L	26	37	10	82	81
Potassium	7440-09-7	1	mg/L	17	11	14	14	12
<b>EG020F: Dissolved Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	0.005	<0.001	0.003	0.028	0.017
Cadmium	7440-43-9	0.0001	mg/L	0.0005	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	0.003	<0.001	0.003	0.002	0.026
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	9.23	7.22	0.465	1.51	1.94
Nickel	7440-02-0	0.001	mg/L	0.544	0.177	0.018	0.078	0.100
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L	1.24	0.094	0.042	0.048	0.109
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Iron	7439-89-6	0.05	mg/L	14.5	3.62	1.42	24.2	15.0
<b>EG035F: Dissolved Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
<b>EK040P: Fluoride by PC Titrator</b>								
Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.1	0.1	<0.1
<b>EN055: Ionic Balance</b>								
Total Anions	----	0.01	meq/L	12.9	9.14	1.81	7.56	8.45
Total Cations	----	0.01	meq/L	12.1	----	1.67	7.81	8.51
Total Cations	----	0.01	meq/L	----	8.92	----	----	----





## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MI_X_5/D2	MI_X_5/D3	MJ_X_MWMP4	MJ_X_MWMP05	MJ_X_MWMP06
				31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323856-001	ES1323856-002	ES1323856-003	ES1323856-004	ES1323856-005
<b>EN055: Ionic Balance - Continued</b>								
Ionic Balance	----	0.01	%	3.02	----	----	1.63	0.33
Ionic Balance	----	0.01	%	----	1.19	----	----	----
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	1	µg/L	<1	<1	----	----	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	5	µg/L	<5	<5	----	----	----
Isopropylbenzene	98-82-8	5	µg/L	<5	<5	----	----	----
n-Propylbenzene	103-65-1	5	µg/L	<5	<5	----	----	----
1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	----	----	----
sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	----	----	----
1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	----	----	----
tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	----	----	----
p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	----	----	----
n-Butylbenzene	104-51-8	5	µg/L	<5	<5	----	----	----
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	50	µg/L	<50	<50	----	----	----
2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	----	----	----
2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	----	----	----
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	5	µg/L	<5	<5	----	----	----
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	----	----	----
1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	----	----	----
cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	----	----	----
trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	----	----	----
1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	----	----	----
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	----	----	----
Chloromethane	74-87-3	50	µg/L	<50	<50	----	----	----
Vinyl chloride	75-01-4	50	µg/L	<50	<50	----	----	----
Bromomethane	74-83-9	50	µg/L	<50	<50	----	----	----
Chloroethane	75-00-3	50	µg/L	<50	<50	----	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

Compound	CAS Number	LOR	Unit	MI_X_5/D2	MI_X_5/D3	MJ_X_MWMP4	MJ_X_MWMP05	MJ_X_MWMP06
				31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00
				ES1323856-001	ES1323856-002	ES1323856-003	ES1323856-004	ES1323856-005
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	----	----	----
1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	----	----	----
Iodomethane	74-88-4	5	µg/L	<5	<5	----	----	----
trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	----	----	----
1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	----	----	----
cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	----	----	----
1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	----	----	----
1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	----	----	----
Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	----	----	----
1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	----	----	----
Trichloroethene	79-01-6	5	µg/L	<5	<5	----	----	----
Dibromomethane	74-95-3	5	µg/L	<5	<5	----	----	----
1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	----	----	----
1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	----	----	----
Tetrachloroethene	127-18-4	5	µg/L	<5	<5	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	----	----	----
1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	----	----	----
Pentachloroethane	76-01-7	5	µg/L	<5	<5	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	----	----	----
Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	----	----	----
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	5	µg/L	<5	<5	----	----	----
Bromobenzene	108-86-1	5	µg/L	<5	<5	----	----	----
2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	----	----	----
4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	----	----	----
1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	----	----	----
1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	----	----	----
1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	----	----	----
1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	----	----	----
1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	----	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MI_X_5/D2	MI_X_5/D3	MJ_X_MWMP4	MJ_X_MWMP05	MJ_X_MWMP06
				31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323856-001	ES1323856-002	ES1323856-003	ES1323856-004	ES1323856-005
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	5	µg/L	<5	<5	----	----	----
Bromodichloromethane	75-27-4	5	µg/L	<5	<5	----	----	----
Dibromochloromethane	124-48-1	5	µg/L	<5	<5	----	----	----
Bromoform	75-25-2	5	µg/L	<5	<5	----	----	----
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	7	µg/L	<7	<7	----	----	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MI_X_5/D2	MI_X_5/D3	MJ_X_MWMP4	MJ_X_MWMP05	MJ_X_MWMP06
				31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323856-001	ES1323856-002	ES1323856-003	ES1323856-004	ES1323856-005
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	63.0	64.7	----	----	----
<b>EP074S: VOC Surrogates</b>								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	99.0	104	----	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MI_X_5/D2	MI_X_5/D3	MJ_X_MWMP4	MJ_X_MWMP05	MJ_X_MWMP06
				31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323856-001	ES1323856-002	ES1323856-003	ES1323856-004	ES1323856-005
<b>EP074S: VOC Surrogates - Continued</b>								
Toluene-D8	2037-26-5	0.1	%	118	127	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	110	117	----	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	26.8	21.4	27.6	32.1	26.4
2-Chlorophenol-D4	93951-73-6	0.1	%	55.6	32.2	59.4	69.0	58.0
2,4,6-Tribromophenol	118-79-6	0.1	%	77.1	68.5	84.4	98.7	87.8
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	64.9	33.0	61.0	75.7	65.2
Anthracene-d10	1719-06-8	0.1	%	61.0	50.1	66.7	72.7	70.4
4-Terphenyl-d14	1718-51-0	0.1	%	67.2	59.5	69.5	74.4	74.4
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	101	116	124	115	124
Toluene-D8	2037-26-5	0.1	%	122	116	101	114	114
4-Bromofluorobenzene	460-00-4	0.1	%	112	106	112	119	121



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MI_X_5/D8	MG_X_4/D5	MG_X_4/D1	D02_GW5_041113	RB_GW3_311013
				31-OCT-2013 15:00	01-NOV-2013 15:00	04-NOV-2013 15:00	04-NOV-2013 15:00	31-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323856-006	ES1323856-007	ES1323856-008	ES1323856-009	ES1323856-010
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	58	80	134	135	<1
Total Alkalinity as CaCO3	----	1	mg/L	58	80	134	135	<1
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	348	586	1480	1490	<1
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	14	21	147	151	<1
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	40	107	273	275	<1
Magnesium	7439-95-4	1	mg/L	49	74	190	192	<1
Sodium	7440-23-5	1	mg/L	66	25	156	158	<1
Potassium	7440-09-7	1	mg/L	10	11	24	24	<1
<b>EG020F: Dissolved Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	<0.001	0.002	0.008	0.011	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.0005	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	0.004	0.003	<0.001	0.001	<0.001
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	0.050	8.68	11.0	9.78	<0.001
Nickel	7440-02-0	0.001	mg/L	0.040	0.069	0.660	0.623	<0.001
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L	0.103	0.092	0.050	0.052	<0.005
Boron	7440-42-8	0.05	mg/L	<0.05	0.13	2.18	1.91	<0.05
Iron	7439-89-6	0.05	mg/L	0.06	63.1	37.5	34.6	<0.05
<b>EG035F: Dissolved Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
<b>EK040P: Fluoride by PC Titrator</b>								
Fluoride	16984-48-8	0.1	mg/L	<0.1	0.3	<0.1	<0.1	<0.1
<b>EN055: Ionic Balance</b>								
Total Anions	----	0.01	meq/L	8.80	14.4	37.6	38.0	<0.01
Total Cations	----	0.01	meq/L	----	----	36.7	37.0	<0.01
Total Cations	----	0.01	meq/L	9.16	15.8	----	----	----





## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MI_X_5/D8	MG_X_4/D5	MG_X_4/D1	D02_GW5_041113	RB_GW3_311013
				31-OCT-2013 15:00	01-NOV-2013 15:00	04-NOV-2013 15:00	04-NOV-2013 15:00	31-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323856-006	ES1323856-007	ES1323856-008	ES1323856-009	ES1323856-010
<b>EN055: Ionic Balance - Continued</b>								
Ionic Balance	----	0.01	%	1.97	----	1.31	1.28	----
Ionic Balance	----	0.01	%	----	4.68	----	----	----
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	1	µg/L	<1	----	----	----	<1
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	5	µg/L	<5	----	----	----	<5
Isopropylbenzene	98-82-8	5	µg/L	<5	----	----	----	<5
n-Propylbenzene	103-65-1	5	µg/L	<5	----	----	----	<5
1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	----	----	----	<5
sec-Butylbenzene	135-98-8	5	µg/L	<5	----	----	----	<5
1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	----	----	----	<5
tert-Butylbenzene	98-06-6	5	µg/L	<5	----	----	----	<5
p-Isopropyltoluene	99-87-6	5	µg/L	<5	----	----	----	<5
n-Butylbenzene	104-51-8	5	µg/L	<5	----	----	----	<5
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	50	µg/L	<50	----	----	----	<50
2-Butanone (MEK)	78-93-3	50	µg/L	<50	----	----	----	<50
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	----	----	----	<50
2-Hexanone (MBK)	591-78-6	50	µg/L	<50	----	----	----	<50
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	5	µg/L	<5	----	----	----	<5
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	5	µg/L	<5	----	----	----	<5
1,2-Dichloropropane	78-87-5	5	µg/L	<5	----	----	----	<5
cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	----	----	----	<5
trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	----	----	----	<5
1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	----	----	----	<5
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	50	µg/L	<50	----	----	----	<50
Chloromethane	74-87-3	50	µg/L	<50	----	----	----	<50
Vinyl chloride	75-01-4	50	µg/L	<50	----	----	----	<50
Bromomethane	74-83-9	50	µg/L	<50	----	----	----	<50
Chloroethane	75-00-3	50	µg/L	<50	----	----	----	<50



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MI_X_5/D8	MG_X_4/D5	MG_X_4/D1	D02_GW5_041113	RB_GW3_311013
				31-OCT-2013 15:00	01-NOV-2013 15:00	04-NOV-2013 15:00	04-NOV-2013 15:00	31-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323856-006	ES1323856-007	ES1323856-008	ES1323856-009	ES1323856-010
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
Trichlorofluoromethane	75-69-4	50	µg/L	<50	----	----	----	<50
1.1-Dichloroethene	75-35-4	5	µg/L	<5	----	----	----	<5
Iodomethane	74-88-4	5	µg/L	<5	----	----	----	<5
trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	----	----	----	<5
1.1-Dichloroethane	75-34-3	5	µg/L	<5	----	----	----	<5
cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	----	----	----	<5
1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	----	----	----	<5
1.1-Dichloropropylene	563-58-6	5	µg/L	<5	----	----	----	<5
Carbon Tetrachloride	56-23-5	5	µg/L	<5	----	----	----	<5
1.2-Dichloroethane	107-06-2	5	µg/L	<5	----	----	----	<5
Trichloroethene	79-01-6	5	µg/L	<5	----	----	----	<5
Dibromomethane	74-95-3	5	µg/L	<5	----	----	----	<5
1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	----	----	----	<5
1.3-Dichloropropane	142-28-9	5	µg/L	<5	----	----	----	<5
Tetrachloroethene	127-18-4	5	µg/L	<5	----	----	----	<5
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	----	----	----	<5
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	----	----	----	<5
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	----	----	----	<5
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	----	----	----	<5
1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	----	----	----	<5
Pentachloroethane	76-01-7	5	µg/L	<5	----	----	----	<5
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	----	----	----	<5
Hexachlorobutadiene	87-68-3	5	µg/L	<5	----	----	----	<5
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	5	µg/L	<5	----	----	----	<5
Bromobenzene	108-86-1	5	µg/L	<5	----	----	----	<5
2-Chlorotoluene	95-49-8	5	µg/L	<5	----	----	----	<5
4-Chlorotoluene	106-43-4	5	µg/L	<5	----	----	----	<5
1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	----	----	----	<5
1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	----	----	----	<5
1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	----	----	----	<5
1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	----	----	----	<5
1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	----	----	----	<5



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MI_X_5/D8	MG_X_4/D5	MG_X_4/D1	D02_GW5_041113	RB_GW3_311013
				31-OCT-2013 15:00	01-NOV-2013 15:00	04-NOV-2013 15:00	04-NOV-2013 15:00	31-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323856-006	ES1323856-007	ES1323856-008	ES1323856-009	ES1323856-010
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	5	µg/L	<5	----	----	----	<5
Bromodichloromethane	75-27-4	5	µg/L	<5	----	----	----	<5
Dibromochloromethane	124-48-1	5	µg/L	<5	----	----	----	<5
Bromoform	75-25-2	5	µg/L	<5	----	----	----	<5
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	7	µg/L	<7	----	----	----	<7
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MI_X_5/D8	MG_X_4/D5	MG_X_4/D1	D02_GW5_041113	RB_GW3_311013
				31-OCT-2013 15:00	01-NOV-2013 15:00	04-NOV-2013 15:00	04-NOV-2013 15:00	31-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323856-006	ES1323856-007	ES1323856-008	ES1323856-009	ES1323856-010
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	59.3	----	----	----	63.5
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	105	----	----	----	102



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MI_X_5/D8	MG_X_4/D5	MG_X_4/D1	D02_GW5_041113	RB_GW3_311013
				31-OCT-2013 15:00	01-NOV-2013 15:00	04-NOV-2013 15:00	04-NOV-2013 15:00	31-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323856-006	ES1323856-007	ES1323856-008	ES1323856-009	ES1323856-010
<b>EP074S: VOC Surrogates - Continued</b>								
Toluene-D8	2037-26-5	0.1	%	115	----	----	----	107
4-Bromofluorobenzene	460-00-4	0.1	%	106	----	----	----	105
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	29.6	31.6	31.5	29.8	20.8
2-Chlorophenol-D4	93951-73-6	0.1	%	65.0	71.6	65.4	64.0	42.6
2,4,6-Tribromophenol	118-79-6	0.1	%	87.5	73.4	67.9	86.1	65.9
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	75.3	75.8	73.2	76.3	52.0
Anthracene-d10	1719-06-8	0.1	%	68.7	76.0	71.3	74.3	59.2
4-Terphenyl-d14	1718-51-0	0.1	%	71.1	83.8	83.1	85.1	84.0
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	107	106	119	113	104
Toluene-D8	2037-26-5	0.1	%	120	97.5	103	101	111
4-Bromofluorobenzene	460-00-4	0.1	%	110	111	110	103	105



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				RB_GW4_011113	RB_GW5_041113	TS	TB	----
				01-NOV-2013 15:00	04-NOV-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1323856-011	ES1323856-012	ES1323856-013	ES1323856-014	----
<b>EG020F: Dissolved Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	----	----	----
Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	----	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	----	----	----
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	----	----	----
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	----	----	----
<b>EG035F: Dissolved Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	----	----	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	----	----	----
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	----	----	----
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	----	----	----
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	----	----	----
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	----	----	----
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	----	----	----
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	----	----	----
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	----	----	----
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	----	----	----
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	----	----	----
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	----	----	----
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	----	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	----	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	----	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	----	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	----	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	----	----	----





## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				RB_GW4_011113	RB_GW5_041113	TS	TB	----
				01-NOV-2013 15:00	04-NOV-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1323856-011	ES1323856-012	ES1323856-013	ES1323856-014	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	----	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	----	----	----
Benzo(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	----	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	----	----	----
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	----	----	----
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	----	----	----
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	----	----	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	20	µg/L	<20	<20	----	<20	----
C10 - C14 Fraction	----	50	µg/L	<50	<50	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	----	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	----	<20	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	----	<20	----
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	<100	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	----	----	----
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	<1	<1	15	<1	----
Toluene	108-88-3	2	µg/L	<2	<2	16	<2	----
Ethylbenzene	100-41-4	2	µg/L	<2	<2	15	<2	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	15	<2	----
ortho-Xylene	95-47-6	2	µg/L	<2	<2	16	<2	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				RB_GW4_011113	RB_GW5_041113	TS	TB	----
				01-NOV-2013 15:00	04-NOV-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1323856-011	ES1323856-012	ES1323856-013	ES1323856-014	----
<b>EP080: BTEXN - Continued</b>								
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	31	<2	----
^ Sum of BTEX	----	1	µg/L	<1	<1	77	<1	----
Naphthalene	91-20-3	5	µg/L	<5	<5	17	<5	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	31.2	25.0	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	66.9	62.2	----	----	----
2,4,6-Tribromophenol	118-79-6	0.1	%	78.3	74.5	----	----	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	78.3	75.5	----	----	----
Anthracene-d10	1719-06-8	0.1	%	74.2	71.1	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	95.8	91.4	----	----	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	108	116	112	125	----
Toluene-D8	2037-26-5	0.1	%	91.8	106	108	109	----
4-Bromofluorobenzene	460-00-4	0.1	%	108	117	106	120	----



## Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP066S: PCB Surrogate</b>			
Decachlorobiphenyl	2051-24-3	28.5	129
<b>EP074S: VOC Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	78.3	133.2
Toluene-D8	2037-26-5	79.1	128.9
4-Bromofluorobenzene	460-00-4	80.8	123.7
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	10.0	44
2-Chlorophenol-D4	93951-73-6	14	94
2,4,6-Tribromophenol	118-79-6	17	125
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27.4	113
4-Terphenyl-d14	1718-51-0	32	112
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

## QUALITY CONTROL REPORT

<b>Work Order</b>	: <b>ES1323856</b>	Page	: 1 of 20
<b>Amendment</b>	: <b>2</b>		
<b>Client</b>	: <b>ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: MR JONATHAN LEKAWSKI	<b>Contact</b>	: Barbara Hanna
<b>Address</b>	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
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<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: WALLERAWANG MT PIPER GW	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b>	: ----		
<b>C-O-C number</b>	: ----	<b>Date Samples Received</b>	: 05-NOV-2013
<b>Sampler</b>	: DB,SH	<b>Issue Date</b>	: 28-JAN-2014
<b>Order number</b>	: 0207423/0207420		
<b>Quote number</b>	: SY/278/13 V3	<b>No. of samples received</b>	: 14
		<b>No. of samples analysed</b>	: 14

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ashesh Patel	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Hoa Nguyen	Senior Inorganic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics



### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :  
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
RPD = Relative Percentage Difference  
# = Indicates failed QC



## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>ED037P: Alkalinity by PC Titrator (QC Lot: 3149393)</b>									
ES1323856-001	ML_X_5/D2	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	80	74	6.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	80	74	6.6	0% - 20%
ES1323856-010	RB_GW3_311013	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	1	0.0	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	1	0.0	No Limit
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3147059)</b>									
ES1323856-001	ML_X_5/D2	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	528	532	0.7	0% - 20%
ES1324005-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	0.0	No Limit
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3149306)</b>									
ES1323856-008	MG_X_4/D1	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1480	1480	0.4	0% - 20%
ES1324006-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2380	2340	1.4	0% - 20%
<b>ED045G: Chloride Discrete analyser (QC Lot: 3147058)</b>									
ES1323856-001	ML_X_5/D2	ED045G: Chloride	16887-00-6	1	mg/L	11	10	12.5	0% - 50%
ES1324005-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	3	3	0.0	No Limit
<b>ED045G: Chloride Discrete analyser (QC Lot: 3149305)</b>									
ES1323856-008	MG_X_4/D1	ED045G: Chloride	16887-00-6	1	mg/L	147	148	0.0	0% - 20%
ES1323921-008	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	374	376	0.4	0% - 20%
<b>ED093F: Dissolved Major Cations (QC Lot: 3147057)</b>									
ES1323856-001	ML_X_5/D2	ED093F: Calcium	7440-70-2	1	mg/L	85	86	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	77	78	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	26	26	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	17	17	0.0	0% - 50%
ES1324005-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	57	56	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	43	42	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	23	23	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
<b>ED093F: Dissolved Major Cations (QC Lot: 3149304)</b>									
ES1323920-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	7	7	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	1	1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	5770	5790	0.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
ES1324087-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	1	1	0.0	No Limit





Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>ED093F: Dissolved Major Cations (QC Lot: 3149304) - continued</b>									
ES1324087-001	Anonymous	ED093F: Magnesium	7439-95-4	1	mg/L	2	2	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	11	11	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
<b>EG020F: Dissolved Metals by ICP-MS (QC Lot: 3146741)</b>									
ES1323856-003	MJ_X_MWMP4	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.003	0.002	35.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.003	0.002	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.465	0.468	0.6	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.018	0.018	0.0	0% - 50%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.042	0.041	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG020A-F: Iron	7439-89-6	0.05	mg/L	1.42	1.21	15.6	0% - 20%		
ES1323856-012	RB_GW5_041113	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit		
<b>EG035F: Dissolved Mercury by FIMS (QC Lot: 3146740)</b>									
ES1323856-001	MI_X_5/D2	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1323856-011	RB_GW4_011113	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
<b>EK040P: Fluoride by PC Titrator (QC Lot: 3149394)</b>									
ES1323856-001	MI_X_5/D2	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.0	No Limit
ES1323856-010	RB_GW3_311013	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3149418)</b>									
ES1323856-001	MI_X_5/D2	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3149418) - continued</b>									
ES1323856-001	ML_X_5/D2	EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
ES1324036-002	Anonymous	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
<b>EP074B: Oxygenated Compounds (QC Lot: 3149418)</b>									
ES1323856-001	ML_X_5/D2	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
ES1324036-002	Anonymous	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
<b>EP074C: Sulfonated Compounds (QC Lot: 3149418)</b>									
ES1323856-001	ML_X_5/D2	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
ES1324036-002	Anonymous	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
<b>EP074D: Fumigants (QC Lot: 3149418)</b>									
ES1323856-001	ML_X_5/D2	EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
ES1324036-002	Anonymous	EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3149418)</b>									
ES1323856-001	ML_X_5/D2	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3149418) - continued</b>									
ES1323856-001	ML_X_5/D2	EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit		
EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit		
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit		
ES1324036-002	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit		



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3149418) - continued</b>									
ES1324036-002	Anonymous	EP074: 1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit		
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3149418)</b>									
ES1323856-001	ML_X_5/D2	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
ES1324036-002	Anonymous	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
<b>EP074G: Trihalomethanes (QC Lot: 3149418)</b>									
ES1323856-001	ML_X_5/D2	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
ES1324036-002	Anonymous	EP074: Chloroform	67-66-3	5	µg/L	9	9	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	11	11	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	15	15	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	5	5	0.0	No Limit
<b>EP074H: Naphthalene (QC Lot: 3149418)</b>									
ES1323856-001	ML_X_5/D2	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074H: Naphthalene (QC Lot: 3149418) - continued</b>									
ES1324036-002	Anonymous	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3148803)</b>									
ES1323856-008	MG_X_4/D1	EP075(SIM): Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	0.0	No Limit
		ES1323856-009	D02_GW5_041113	EP075(SIM): Phenol	108-95-2	1.0	µg/L	<1.0	<1.0
EP075(SIM): 2-Chlorophenol	95-57-8			1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): 2-Methylphenol	95-48-7			1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): 2-Nitrophenol	88-75-5			1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): 2.4-Dimethylphenol	105-67-9			1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): 2.4-Dichlorophenol	120-83-2			1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): 2.6-Dichlorophenol	87-65-0			1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7			1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2			1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4			1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): 3- & 4-Methylphenol	1319-77-3			2.0	µg/L	<2.0	<2.0	0.0	No Limit
EP075(SIM): Pentachlorophenol	87-86-5			2.0	µg/L	<2.0	<2.0	0.0	No Limit
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3148803)</b>									
ES1323856-008	MG_X_4/D1	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3148803) - continued</b>									
ES1323856-008	MG_X_4/D1	EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
ES1323856-009	D02_GW5_041113	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit		
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3148802)</b>									
ES1323856-008	MG_X_4/D1	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
ES1323856-009	D02_GW5_041113	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3149419)</b>									
ES1323856-001	MI_X_5/D2	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3150675)</b>									
ES1323856-003	MJ_X_MWMP4	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1323895-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3148802)</b>									
ES1323856-008	MG_X_4/D1	EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
ES1323856-009	D02_GW5_041113	EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3149419)</b>									





Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3149419) - continued</b>										
ES1323856-001	MI_X_5/D2	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3150675)</b>										
ES1323856-003	MJ_X_MWMP4	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit	
ES1323895-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit	
<b>EP080: BTEXN (QC Lot: 3149419)</b>										
ES1323856-001	MI_X_5/D2	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit	
	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit		
<b>EP080: BTEXN (QC Lot: 3150675)</b>										
ES1323856-003	MJ_X_MWMP4	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit	
	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit		
ES1323895-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	17	19	9.0	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit	
	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit		



### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>ED037P: Alkalinity by PC Titrator (QCLot: 3149393)</b>									
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	----	200 mg/L	93.1	81	111	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3147059)</b>									
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	102	86	122	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3149306)</b>									
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	101	86	122	
<b>ED045G: Chloride Discrete analyser (QCLot: 3147058)</b>									
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	92.6	77	123	
<b>ED045G: Chloride Discrete analyser (QCLot: 3149305)</b>									
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	93.3	77	123	
<b>ED093F: Dissolved Major Cations (QCLot: 3147057)</b>									
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	96.2	87	113	
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	95.0	89	113	
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	93.2	79	113	
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.3	87	115	
<b>ED093F: Dissolved Major Cations (QCLot: 3149304)</b>									
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	94.2	87	113	
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	95.0	89	113	
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	108	79	113	
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	109	87	115	
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3146741)</b>									
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	92.5	80	118	
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	87.0	82	112	
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	94.7	81	111	
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	88.2	80	112	
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	88.3	83	111	
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	89.7	81	113	
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	86.0	81	113	
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	84.2	73	125	
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	90.0	80	116	
EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.1 mg/L	114	69	123	
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	92.9	77	115	
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3146740)</b>									
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	102	78	114	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
					LCS	Low	High		
<b>EK040P: Fluoride by PC Titrator (QCLot: 3149394)</b>									
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5.0 mg/L	105	75	119	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3148801)</b>									
EP066: Total Polychlorinated biphenyls	----	1	µg/L	<1	10 µg/L	79.7	61.6	107	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3149418)</b>									
EP074: Styrene	100-42-5	5	µg/L	<5	10 µg/L	100	74	118	
EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	10 µg/L	116	75	121	
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	10 µg/L	111	67	123	
EP074: 1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	10 µg/L	114	70	122	
EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	10 µg/L	115	69	123	
EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	10 µg/L	113	71	121	
EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	10 µg/L	110	70	122	
EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	10 µg/L	121	67	123	
EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	10 µg/L	122	62	126	
<b>EP074B: Oxygenated Compounds (QCLot: 3149418)</b>									
EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	100 µg/L	105	61.4	134	
EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	100 µg/L	89.6	73.6	130	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	100 µg/L	96.2	61	139	
EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	100 µg/L	92.1	65	137	
<b>EP074C: Sulfonated Compounds (QCLot: 3149418)</b>									
EP074: Carbon disulfide	75-15-0	5	µg/L	<5	10 µg/L	124	72.8	127	
<b>EP074D: Fumigants (QCLot: 3149418)</b>									
EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	10 µg/L	103	61	119	
EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	10 µg/L	102	76	120	
EP074: cis-1,3-Dichloropropylene	10061-01-5	10	µg/L	<10	10 µg/L	91.3	62	120	
EP074: trans-1,3-Dichloropropylene	10061-02-6	10	µg/L	<10	10 µg/L	88.3	61	119	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	10 µg/L	101	69	117	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3149418)</b>									
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	100 µg/L	111	60.6	138	
EP074: Chloromethane	74-87-3	50	µg/L	<50	100 µg/L	110	67.4	130	
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	100 µg/L	102	69.4	129	
EP074: Bromomethane	74-83-9	50	µg/L	<50	100 µg/L	107	56	140	
EP074: Chloroethane	75-00-3	50	µg/L	<50	100 µg/L	108	63	135	
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	100 µg/L	118	65	131	
EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	10 µg/L	115	69	123	
EP074: Iodomethane	74-88-4	5	µg/L	<5	10 µg/L	99.5	70.2	128	
EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	10 µg/L	108	71	119	
EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	10 µg/L	105	75	119	
EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	10 µg/L	107	77	117	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3149418) - continued</b>									
EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	10 µg/L	103	61	119	
EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	10 µg/L	101	73	119	
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	10 µg/L	104	63	121	
EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	10 µg/L	97.1	78	122	
EP074: Trichloroethene	79-01-6	5	µg/L	<5	10 µg/L	105	74	120	
EP074: Dibromomethane	74-95-3	5	µg/L	<5	10 µg/L	97.0	74	118	
EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	10 µg/L	107	75	123	
EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	10 µg/L	95.2	79	121	
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	10 µg/L	112	72	124	
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	10 µg/L	108	66	114	
EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	10 µg/L	100	60	120	
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	10 µg/L	93.6	70.6	128	
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	10 µg/L	101	70	124	
EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	10 µg/L	102	74	128	
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	10 µg/L	103	71.8	126	
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	10 µg/L	106	66.4	136	
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	10 µg/L	126	58	132	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3149418)</b>									
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	10 µg/L	106	80	118	
EP074: Bromobenzene	108-86-1	5	µg/L	<5	10 µg/L	104	76	116	
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	10 µg/L	112	71	121	
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	10 µg/L	110	71	121	
EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	10 µg/L	109	74	120	
EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	10 µg/L	112	72	120	
EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	10 µg/L	105	77	117	
EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	10 µg/L	117	60	126	
EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	10 µg/L	101	67	125	
<b>EP074G: Trihalomethanes (QCLot: 3149418)</b>									
EP074: Chloroform	67-66-3	5	µg/L	<5	10 µg/L	102	76	118	
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	10 µg/L	98.9	64	118	
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	10 µg/L	114	65	115	
EP074: Bromoform	75-25-2	5	µg/L	<5	10 µg/L	118	73.5	126	
<b>EP074H: Naphthalene (QCLot: 3149418)</b>									
EP074: Naphthalene	91-20-3	7	µg/L	<7	10 µg/L	92.7	61	125	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3148803)</b>									
EP075(SIM): Phenol	108-95-2	0.2	µg/L	----	5 µg/L	32.7	24.5	61.9	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Chlorophenol	95-57-8	0.2	µg/L	----	5 µg/L	69.6	63.8	110	
		1	µg/L	<1.0	----	----	----	----	



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3148803) - continued</b>									
EP075(SIM): 2-Methylphenol	95-48-7	0.2	µg/L	----	5 µg/L	65.1	55.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	0.4	µg/L	----	10 µg/L	63.6	42.5	114	
		2	µg/L	<2.0	----	----	----	----	
EP075(SIM): 2-Nitrophenol	88-75-5	0.2	µg/L	----	5 µg/L	71.1	62.7	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.2	µg/L	----	5 µg/L	81.2	59.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.2	µg/L	----	5 µg/L	80.4	59.3	122	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.2	µg/L	----	5 µg/L	78.0	64.3	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.2	µg/L	----	5 µg/L	93.8	63	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.2	µg/L	----	5 µg/L	83.7	58.7	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.2	µg/L	----	5 µg/L	91.4	50	108	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Pentachlorophenol	87-86-5	0.4	µg/L	----	10 µg/L	91.7	8.7	95	
		2	µg/L	<2.0	----	----	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3148803)</b>									
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	5 µg/L	76.2	58.6	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	5 µg/L	79.8	63.6	114	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	5 µg/L	76.8	62.2	113	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	5 µg/L	83.4	63.9	115	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	5 µg/L	82.5	62.6	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	5 µg/L	81.0	64.3	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	5 µg/L	74.4	63.6	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	5 µg/L	80.6	63.1	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	5 µg/L	83.3	64.1	117	
		1	µg/L	<1.0	----	----	----	----	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3148803) - continued</b>									
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	5 µg/L	83.6	62.5	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	5 µg/L	73.8	61.7	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	5 µg/L	76.9	61.7	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	5 µg/L	85.7	63.3	117	
		0.5	µg/L	<0.5	----	----	----	----	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	5 µg/L	66.2	59.9	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	----	5 µg/L	65.7	61.2	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	----	5 µg/L	69.0	59.1	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	1	µg/L	<1.0	----	----	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3148802)</b>									
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	97.4	59	129	
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	101	71	131	
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	99.0	62	120	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3149419)</b>									
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	106	75	127	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3150675)</b>									
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	92.5	75	127	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3148802)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	2500 µg/L	100	58.9	131	
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	101	73.9	138	
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----	
		50	µg/L	----	1500 µg/L	104	67	127	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3149419)</b>									
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	108	75	127	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3150675)</b>									
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	103	75	127	
<b>EP080: BTEXN (QCLot: 3149419)</b>									
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	108	70	124	
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	112	65	129	
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	110	70	120	
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	106	69	121	





Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EP080: BTEXN (QCLot: 3149419) - continued</b>									
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	110	72	122	
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	100	70	124	
<b>EP080: BTEXN (QCLot: 3150675)</b>									
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	95.5	70	124	
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	97.4	65	129	
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	104	70	120	
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	109	69	121	
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	114	72	122	
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	104	70	124	

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%) Low High	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3147059)</b>							
ES1323856-001	MI_X_5/D2	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3149306)</b>							
ES1323856-008	MG_X_4/D1	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130
<b>ED045G: Chloride Discrete analyser (QCLot: 3147058)</b>							
ES1323856-001	MI_X_5/D2	ED045G: Chloride	16887-00-6	250 mg/L	96.8	70	130
<b>ED045G: Chloride Discrete analyser (QCLot: 3149305)</b>							
ES1323856-008	MG_X_4/D1	ED045G: Chloride	16887-00-6	250 mg/L	91.4	70	130
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3146741)</b>							
ES1323856-004	MJ_X_MWMP05	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	113	70	130
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	108	70	130
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	124	70	130
		EG020A-F: Copper	7440-50-8	0.2 mg/L	115	70	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	106	70	130
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	# Not Determined	70	130
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	104	70	130
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	115	70	130



Sub-Matrix: WATER

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3146740)</b>							
ES1323856-002	MI_X_5/D3	EG035F: Mercury	7439-97-6	0.0100 mg/L	90.5	70	130
<b>EK040P: Fluoride by PC Titrator (QCLot: 3149394)</b>							
ES1323856-001	MI_X_5/D2	EK040P: Fluoride	16984-48-8	5.0 mg/L	112	70	130
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3149418)</b>							
ES1323856-001	MI_X_5/D2	EP074: 1,1-Dichloroethene	75-35-4	25 µg/L	114	70	130
		EP074: Trichloroethene	79-01-6	25 µg/L	109	70	130
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3149418)</b>							
ES1323856-001	MI_X_5/D2	EP074: Chlorobenzene	108-90-7	25 µg/L	117	70	130
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3148803)</b>							
ES1323856-008	MG_X_4/D1	EP075(SIM): Phenol	108-95-2	20 µg/L	33.2	20	130
		EP075(SIM): 2-Chlorophenol	95-57-8	20 µg/L	72.8	60	130
		EP075(SIM): 2-Nitrophenol	88-75-5	20 µg/L	74.1	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	20 µg/L	89.0	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	20 µg/L	81.9	20	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3148803)</b>							
ES1323856-008	MG_X_4/D1	EP075(SIM): Acenaphthene	83-32-9	20 µg/L	74.0	70	130
		EP075(SIM): Pyrene	129-00-0	20 µg/L	81.2	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3148802)</b>							
ES1323856-008	MG_X_4/D1	EP071: C10 - C14 Fraction	----	200 µg/L	112	74	150
		EP071: C15 - C28 Fraction	----	300 µg/L	94.4	77	153
		EP071: C29 - C36 Fraction	----	200 µg/L	98.4	67	153
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3149419)</b>							
ES1323856-001	MI_X_5/D2	EP080: C6 - C9 Fraction	----	325 µg/L	126	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3150675)</b>							
ES1323856-003	MJ_X_MWMP4	EP080: C6 - C9 Fraction	----	325 µg/L	114	70	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3148802)</b>							
ES1323856-008	MG_X_4/D1	EP071: >C10 - C16 Fraction	>C10_C16	250 µg/L	109	74	150
		EP071: >C16 - C34 Fraction	----	350 µg/L	92.7	77	153
		EP071: >C34 - C40 Fraction	----	150 µg/L	104	67	153
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3149419)</b>							
ES1323856-001	MI_X_5/D2	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	127	70	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3150675)</b>							
ES1323856-003	MJ_X_MWMP4	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	118	70	130
<b>EP080: BTEXN (QCLot: 3149419)</b>							
ES1323856-001	MI_X_5/D2	EP080: Benzene	71-43-2	25 µg/L	108	70	130





Sub-Matrix: WATER

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3147059) - continued</b>										
ES1323856-001	MI_X_5/D2	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3148802)</b>										
ES1323856-008	MG_X_4/D1	EP071: C10 - C14 Fraction	----	200 µg/L	112	----	74	150	----	----
		EP071: C15 - C28 Fraction	----	300 µg/L	94.4	----	77	153	----	----
		EP071: C29 - C36 Fraction	----	200 µg/L	98.4	----	67	153	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3148802)</b>										
ES1323856-008	MG_X_4/D1	EP071: >C10 - C16 Fraction	>C10_C16	250 µg/L	109	----	74	150	----	----
		EP071: >C16 - C34 Fraction	----	350 µg/L	92.7	----	77	153	----	----
		EP071: >C34 - C40 Fraction	----	150 µg/L	104	----	67	153	----	----
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3148803)</b>										
ES1323856-008	MG_X_4/D1	EP075(SIM): Phenol	108-95-2	20 µg/L	33.2	----	20	130	----	----
		EP075(SIM): 2-Chlorophenol	95-57-8	20 µg/L	72.8	----	60	130	----	----
		EP075(SIM): 2-Nitrophenol	88-75-5	20 µg/L	74.1	----	60	130	----	----
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	20 µg/L	89.0	----	70	130	----	----
		EP075(SIM): Pentachlorophenol	87-86-5	20 µg/L	81.9	----	20	130	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3148803)</b>										
ES1323856-008	MG_X_4/D1	EP075(SIM): Acenaphthene	83-32-9	20 µg/L	74.0	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	20 µg/L	81.2	----	70	130	----	----
<b>ED045G: Chloride Discrete analyser (QCLot: 3149305)</b>										
ES1323856-008	MG_X_4/D1	ED045G: Chloride	16887-00-6	250 mg/L	91.4	----	70	130	----	----
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3149306)</b>										
ES1323856-008	MG_X_4/D1	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	----	70	130	----	----
<b>EK040P: Fluoride by PC Titrator (QCLot: 3149394)</b>										
ES1323856-001	MI_X_5/D2	EK040P: Fluoride	16984-48-8	5.0 mg/L	112	----	70	130	----	----
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3149418)</b>										
ES1323856-001	MI_X_5/D2	EP074: 1,1-Dichloroethene	75-35-4	25 µg/L	114	----	70	130	----	----
		EP074: Trichloroethene	79-01-6	25 µg/L	109	----	70	130	----	----
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3149418)</b>										
ES1323856-001	MI_X_5/D2	EP074: Chlorobenzene	108-90-7	25 µg/L	117	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3149419)</b>										
ES1323856-001	MI_X_5/D2	EP080: C6 - C9 Fraction	----	325 µg/L	126	----	70	130	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3149419)</b>										
ES1323856-001	MI_X_5/D2	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	127	----	70	130	----	----
<b>EP080: BTEXN (QCLot: 3149419)</b>										
ES1323856-001	MI_X_5/D2	EP080: Benzene	71-43-2	25 µg/L	108	----	70	130	----	----



Sub-Matrix: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>EP080: BTEXN (QCLot: 3149419) - continued</b>										
ES1323856-001	MI_X_5/D2	EP080: Toluene	108-88-3	25 µg/L	111	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	25 µg/L	118	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	113	----	70	130	----	----
		EP080: ortho-Xylene	95-47-6	25 µg/L	116	----	70	130	----	----
		EP080: Naphthalene	91-20-3	25 µg/L	96.0	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3150675)</b>										
ES1323856-003	MJ_X_MWMP4	EP080: C6 - C9 Fraction	----	325 µg/L	114	----	70	130	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3150675)</b>										
ES1323856-003	MJ_X_MWMP4	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	118	----	70	130	----	----
<b>EP080: BTEXN (QCLot: 3150675)</b>										
ES1323856-003	MJ_X_MWMP4	EP080: Benzene	71-43-2	25 µg/L	111	----	70	130	----	----
		EP080: Toluene	108-88-3	25 µg/L	114	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	25 µg/L	115	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	104	----	70	130	----	----
		EP080: ortho-Xylene	95-47-6	25 µg/L	119	----	70	130	----	----
		EP080: Naphthalene	91-20-3	25 µg/L	107	----	70	130	----	----

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1323856</b>	Page	: 1 of 11
Amendment	: <b>2</b>		
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
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Project	: WALLERAWANG MT PIPER GW	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 05-NOV-2013
Sampler	: DB,SH	Issue Date	: 28-JAN-2014
Order number	: 0207423/0207420		
Quote number	: SY/278/13 V3	No. of samples received	: 14
		No. of samples analysed	: 14

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers





## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>ED037P: Alkalinity by PC Titrator</b>							
Clear Plastic Bottle - Natural (ED037-P) MG_X_4/D5	01-NOV-2013	---	15-NOV-2013	----	08-NOV-2013	15-NOV-2013	✓
Clear Plastic Bottle - Natural (ED037-P) MG_X_4/D1, D02_GW5_041113	04-NOV-2013	---	18-NOV-2013	----	08-NOV-2013	18-NOV-2013	✓
Clear Plastic Bottle - Natural (ED037-P) MI_X_5/D2, MJ_X_MWMP4, MJ_X_MWMP06, RB_GW3_311013 MI_X_5/D3, MJ_X_MWMP05, MI_X_5/D8,	31-OCT-2013	---	14-NOV-2013	----	08-NOV-2013	14-NOV-2013	✓
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>							
Clear Plastic Bottle - Natural (ED041G) MG_X_4/D5	01-NOV-2013	---	29-NOV-2013	----	07-NOV-2013	29-NOV-2013	✓
Clear Plastic Bottle - Natural (ED041G) MG_X_4/D1, D02_GW5_041113	04-NOV-2013	---	02-DEC-2013	----	08-NOV-2013	02-DEC-2013	✓
Clear Plastic Bottle - Natural (ED041G) MI_X_5/D2, MJ_X_MWMP4, MJ_X_MWMP06, RB_GW3_311013 MI_X_5/D3, MJ_X_MWMP05, MI_X_5/D8,	31-OCT-2013	---	28-NOV-2013	----	07-NOV-2013	28-NOV-2013	✓
<b>ED045G: Chloride Discrete analyser</b>							
Clear Plastic Bottle - Natural (ED045G) MG_X_4/D5	01-NOV-2013	---	29-NOV-2013	----	07-NOV-2013	29-NOV-2013	✓
Clear Plastic Bottle - Natural (ED045G) MG_X_4/D1, D02_GW5_041113	04-NOV-2013	---	02-DEC-2013	----	08-NOV-2013	02-DEC-2013	✓
Clear Plastic Bottle - Natural (ED045G) MI_X_5/D2, MJ_X_MWMP4, MJ_X_MWMP06, RB_GW3_311013 MI_X_5/D3, MJ_X_MWMP05, MI_X_5/D8,	31-OCT-2013	---	28-NOV-2013	----	07-NOV-2013	28-NOV-2013	✓



Matrix: WATER

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>ED093F: Dissolved Major Cations</b>							
Clear Plastic Bottle - Natural (ED093F) MG_X_4/D5	01-NOV-2013	---	08-NOV-2013	----	07-NOV-2013	08-NOV-2013	✓
Clear Plastic Bottle - Natural (ED093F) MG_X_4/D1, D02_GW5_041113	04-NOV-2013	---	11-NOV-2013	----	08-NOV-2013	11-NOV-2013	✓
Clear Plastic Bottle - Natural (ED093F) MI_X_5/D2, MI_X_5/D3, MJ_X_MWMP4, MJ_X_MWMP05, MJ_X_MWMP06, MI_X_5/D8, RB_GW3_311013	31-OCT-2013	---	07-NOV-2013	----	07-NOV-2013	07-NOV-2013	✓
<b>EG020F: Dissolved Metals by ICP-MS</b>							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) MG_X_4/D5, RB_GW4_011113	01-NOV-2013	---	30-APR-2014	----	07-NOV-2013	30-APR-2014	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) MG_X_4/D1, D02_GW5_041113, RB_GW5_041113	04-NOV-2013	---	03-MAY-2014	----	07-NOV-2013	03-MAY-2014	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) MI_X_5/D2, MI_X_5/D3, MJ_X_MWMP4, MJ_X_MWMP05, MJ_X_MWMP06, MI_X_5/D8, RB_GW3_311013	31-OCT-2013	---	29-APR-2014	----	07-NOV-2013	29-APR-2014	✓
<b>EG035F: Dissolved Mercury by FIMS</b>							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) MG_X_4/D5, RB_GW4_011113	01-NOV-2013	---	29-NOV-2013	----	08-NOV-2013	29-NOV-2013	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) MG_X_4/D1, D02_GW5_041113, RB_GW5_041113	04-NOV-2013	---	02-DEC-2013	----	08-NOV-2013	02-DEC-2013	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) MI_X_5/D2, MI_X_5/D3, MJ_X_MWMP4, MJ_X_MWMP05, MJ_X_MWMP06, MI_X_5/D8, RB_GW3_311013	31-OCT-2013	---	28-NOV-2013	----	08-NOV-2013	28-NOV-2013	✓
<b>EK040P: Fluoride by PC Titrator</b>							
Clear Plastic Bottle - Natural (EK040P) MG_X_4/D5	01-NOV-2013	---	29-NOV-2013	----	08-NOV-2013	29-NOV-2013	✓
Clear Plastic Bottle - Natural (EK040P) MG_X_4/D1, D02_GW5_041113	04-NOV-2013	---	02-DEC-2013	----	08-NOV-2013	02-DEC-2013	✓
Clear Plastic Bottle - Natural (EK040P) MI_X_5/D2, MI_X_5/D3, MJ_X_MWMP4, MJ_X_MWMP05, MJ_X_MWMP06, MI_X_5/D8, RB_GW3_311013	31-OCT-2013	---	28-NOV-2013	----	08-NOV-2013	28-NOV-2013	✓



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
<b>Amber Glass Bottle - Unpreserved (EP066)</b> MI_X_5/D2, MI_X_5/D8,	MI_X_5/D3, RB_GW3_311013	31-OCT-2013	07-NOV-2013	07-NOV-2013	✓	09-NOV-2013	18-DEC-2013	✓
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
<b>Amber Glass Bottle - Unpreserved (EP071)</b> MG_X_4/D5,	RB_GW4_011113	01-NOV-2013	07-NOV-2013	08-NOV-2013	✓	09-NOV-2013	18-DEC-2013	✓
<b>Amber Glass Bottle - Unpreserved (EP071)</b> MG_X_4/D1, RB_GW5_041113	D02_GW5_041113,	04-NOV-2013	07-NOV-2013	11-NOV-2013	✓	09-NOV-2013	18-DEC-2013	✓
<b>Amber Glass Bottle - Unpreserved (EP071)</b> MI_X_5/D2, MJ_X_MWMP4, MJ_X_MWMP06, RB_GW3_311013	MI_X_5/D3, MJ_X_MWMP05, MI_X_5/D8,	31-OCT-2013	07-NOV-2013	07-NOV-2013	✓	09-NOV-2013	18-DEC-2013	✓
<b>EP074D: Fumigants</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> MI_X_5/D2, MI_X_5/D8,	MI_X_5/D3, RB_GW3_311013	31-OCT-2013	11-NOV-2013	14-NOV-2013	✓	11-NOV-2013	14-NOV-2013	✓
<b>EP074E: Halogenated Aliphatic Compounds</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> MI_X_5/D2, MI_X_5/D8,	MI_X_5/D3, RB_GW3_311013	31-OCT-2013	11-NOV-2013	14-NOV-2013	✓	11-NOV-2013	14-NOV-2013	✓
<b>EP074F: Halogenated Aromatic Compounds</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> MI_X_5/D2, MI_X_5/D8,	MI_X_5/D3, RB_GW3_311013	31-OCT-2013	11-NOV-2013	14-NOV-2013	✓	11-NOV-2013	14-NOV-2013	✓
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> MI_X_5/D2, MI_X_5/D8,	MI_X_5/D3, RB_GW3_311013	31-OCT-2013	11-NOV-2013	14-NOV-2013	✓	11-NOV-2013	14-NOV-2013	✓
<b>EP074H: Naphthalene</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> MI_X_5/D2, MI_X_5/D8,	MI_X_5/D3, RB_GW3_311013	31-OCT-2013	11-NOV-2013	14-NOV-2013	✓	11-NOV-2013	14-NOV-2013	✓
<b>EP074B: Oxygenated Compounds</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> MI_X_5/D2, MI_X_5/D8,	MI_X_5/D3, RB_GW3_311013	31-OCT-2013	11-NOV-2013	14-NOV-2013	✓	11-NOV-2013	14-NOV-2013	✓



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP074C: Sulfonated Compounds</b>								
Amber VOC Vial - Sulfuric Acid (EP074) MI_X_5/D2, MI_X_5/D8,	MI_X_5/D3, RB_GW3_311013	31-OCT-2013	11-NOV-2013	14-NOV-2013	✓	11-NOV-2013	14-NOV-2013	✓
<b>EP074G: Trihalomethanes</b>								
Amber VOC Vial - Sulfuric Acid (EP074) MI_X_5/D2, MI_X_5/D8,	MI_X_5/D3, RB_GW3_311013	31-OCT-2013	11-NOV-2013	14-NOV-2013	✓	11-NOV-2013	14-NOV-2013	✓
<b>EP075(SIM)A: Phenolic Compounds</b>								
Amber Glass Bottle - Unpreserved (EP075(SIM)) MG_X_4/D5,	RB_GW4_011113	01-NOV-2013	07-NOV-2013	08-NOV-2013	✓	09-NOV-2013	18-DEC-2013	✓
Amber Glass Bottle - Unpreserved (EP075(SIM)) MG_X_4/D1, RB_GW5_041113	D02_GW5_041113,	04-NOV-2013	07-NOV-2013	11-NOV-2013	✓	09-NOV-2013	18-DEC-2013	✓
Amber Glass Bottle - Unpreserved (EP075(SIM)) MI_X_5/D2, MJ_X_MWMP4, MJ_X_MWMP06, RB_GW3_311013	MI_X_5/D3, MJ_X_MWMP05, MI_X_5/D8,	31-OCT-2013	07-NOV-2013	07-NOV-2013	✓	09-NOV-2013	18-DEC-2013	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Amber Glass Bottle - Unpreserved (EP075(SIM)) MG_X_4/D5,	RB_GW4_011113	01-NOV-2013	07-NOV-2013	08-NOV-2013	✓	09-NOV-2013	18-DEC-2013	✓
Amber Glass Bottle - Unpreserved (EP075(SIM)) MG_X_4/D1, RB_GW5_041113	D02_GW5_041113,	04-NOV-2013	07-NOV-2013	11-NOV-2013	✓	09-NOV-2013	18-DEC-2013	✓
Amber Glass Bottle - Unpreserved (EP075(SIM)) MI_X_5/D2, MJ_X_MWMP4, MJ_X_MWMP06, RB_GW3_311013	MI_X_5/D3, MJ_X_MWMP05, MI_X_5/D8,	31-OCT-2013	07-NOV-2013	07-NOV-2013	✓	09-NOV-2013	18-DEC-2013	✓
<b>EP080: BTEXN</b>								
Amber VOC Vial - Sulfuric Acid (EP080) MG_X_4/D5,	RB_GW4_011113	01-NOV-2013	11-NOV-2013	15-NOV-2013	✓	11-NOV-2013	15-NOV-2013	✓
Amber VOC Vial - Sulfuric Acid (EP080) MG_X_4/D1, RB_GW5_041113	D02_GW5_041113,	04-NOV-2013	11-NOV-2013	18-NOV-2013	✓	11-NOV-2013	18-NOV-2013	✓
Amber VOC Vial - Sulfuric Acid (EP080) TS,	TB	30-OCT-2013	11-NOV-2013	13-NOV-2013	✓	11-NOV-2013	13-NOV-2013	✓
Amber VOC Vial - Sulfuric Acid (EP080) MI_X_5/D2, MJ_X_MWMP4, MJ_X_MWMP06, RB_GW3_311013	MI_X_5/D3, MJ_X_MWMP05, MI_X_5/D8,	31-OCT-2013	11-NOV-2013	14-NOV-2013	✓	11-NOV-2013	14-NOV-2013	✓

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 Work Order : ES1323856 Amendment 2  
 Client : ENVIRO RESOURCES MANAGEMENT  
 Project : WALLERAWANG MT PIPER GW



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MG_X_4/D5,	RB_GW4_011113	01-NOV-2013	11-NOV-2013	15-NOV-2013	✓	11-NOV-2013	15-NOV-2013	✓
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MG_X_4/D1, RB_GW5_041113	D02_GW5_041113,	04-NOV-2013	11-NOV-2013	18-NOV-2013	✓	11-NOV-2013	18-NOV-2013	✓
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> TB		30-OCT-2013	11-NOV-2013	13-NOV-2013	✓	11-NOV-2013	13-NOV-2013	✓
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MI_X_5/D2, MJ_X_MWMP4, MJ_X_MWMP06, RB_GW3_311013	MI_X_5/D3, MJ_X_MWMP05, MI_X_5/D8,	31-OCT-2013	11-NOV-2013	14-NOV-2013	✓	11-NOV-2013	14-NOV-2013	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Alkalinity by PC Titrator	ED037-P	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	4	39	10.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	2	13	15.4	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	12	16.7	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	4	40	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	2	17	11.8	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	31	12.9	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	15	13.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	3	28	10.7	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
Alkalinity by PC Titrator	ED037-P	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	4	39	10.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	13	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	4	25.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	31	6.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	15	6.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	28	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
Chloride by Discrete Analyser	ED045G	2	39	5.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	13	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	4	25.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	31	6.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	15	6.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	28	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement





Matrix: **WATER** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Matrix Spikes (MS)</b>							
Chloride by Discrete Analyser	ED045G	2	39	5.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	13	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	31	6.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	15	6.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	28	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Sulfate (Turbidimetric) as SO <sub>4</sub> <sup>2-</sup> by Discrete Analyser	ED041G	WATER	APHA 21st ed., 4500-SO <sub>4</sub> Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> <sup>2-</sup> concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Chloride by Discrete Analyser	ED045G	WATER	APHA 21st ed., 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	Major Cations is determined based on APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um filtered sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Hardness parameters are calculated based on APHA 21st ed., 2340 B. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): Samples are 0.45 um filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) Samples are 0.45 um filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Fluoride by PC Titrator	EK040P	WATER	APHA 21st ed., 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Ionic Balance by PCT DA and Turbi SO <sub>4</sub> DA	EN055 - PG	WATER	APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by Turbi SO <sub>4</sub> by DA. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)



Analytical Methods	Method	Matrix	Method Descriptions
Polychlorinated Biphenyls (PCB)	EP066	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
TPH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Volatile Organic Compounds	EP074	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
TPH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
Separatory Funnel Extraction of Liquids	ORG14	WATER	USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.



## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Matrix Spike (MS) Recoveries</b>							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	ES1323856-008	MG_X_4/D1	Sulfate as SO4 - Turbidimetric	14808-79-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	ES1323856-001	MI_X_5/D2	Sulfate as SO4 - Turbidimetric	14808-79-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG020F: Dissolved Metals by ICP-MS	ES1323856-004	MJ_X_MWMP05	Manganese	7439-96-5	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.

#### Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- No Analysis Holding Time Outliers exist.

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.



**CHAIN OF CUSTODY**  
ALS Laboratory  
please tick →

DARLEANE 21 Burma Road Beerra 5A 506  
Ph: 08 8350 0600 E: darleane@alslab.com  
DARRIS/SHANE 32 Strand Street Stirling QLD 4053  
Ph: 07 3253 1722 E: samples@alslab.com  
DGLADSTONE 46 Callenmonan Drive Chino QLD 4050  
Ph: 07 471 5500 E: gladstone@alslab.com

DIAMOCKAY 78 Harbour Road Mackay QLD 4740  
Ph: 07 4944 0177 E: mackay@alslab.com  
DIEMER/OLIVIERE 2-4 Wessell Road Springvale VIC 3171  
Ph: 03 8540 9800 E: samples.melbourne@alslab.com  
DIJALDIE 27 Sydney Road Adelaide NSW 2150  
Ph: 08 8372 8738 E: mudgee@alslab.com

DINENCASTLE 6 Rose Gum Road Warabrook NSW 2304  
Ph: 02 4600 6433 E: samples.norcastle@alslab.com  
DINOWRA 413 Garry Place North Nowra NSW 2541  
Ph: 02 4423 2035 E: nowra@alslab.com  
DIPERTH 10 Hood Way Mudgee WA 6090  
Ph: 08 9209 7055 E: samples.perth@alslab.com

**CLIENT:** ERM  
**OFFICE:** GROUND FLOOR, 33 SAUNDERS ST, PYRMONT NSW 2009  
**PROJECT:** Water/wrang/M Pipe GW  
**ORDER NUMBER:** 0207423/0207420  
**PROJECT MANAGER:** Jonathan Lekawski  
**CONTACT PH:**

**TURNAROUND REQUIREMENTS:**  
 Standard TAT (List due date):  
 Non Standard or urgent TAT (List due date):  
ALS QUOTE NO.: SY178/13

**RECEIVED BY:** Steven Holloman  
**DATE/TIME:** 4/11/13 9:00

**RELINQUISHED BY:** Steve Holloman  
**DATE/TIME:** 4/11/13

**FOR LABORATORY USE ONLY**  
Custody Seal (Ink)  
Facilities/Version  
Sample ID  
Relinquish Date/Time  
Other Comments

Telephone: +61-2-8784 8555

Work Order  
**ES1323856**

**SAMPLER:** Dane Brookes/Skye Holloman  
**SAMPLER MOBILE:** 0400918365  
**COG emailed to ALS?** (YES / NO)  
**EDD FORMAT** (or default): PDF/CVS/EDAT  
**Email Reports to** (will default to PM if no other addresses are listed): Symphony.DeltaWaters@erm.com  
**Email Invoice to** (will default to PM if no other addresses are listed): Symphony.DeltaWaters@erm.com

**RECEIVED BY:** Steve Holloman  
**DATE/TIME:** 4/11/13 9:00

**RELINQUISHED BY:** Steve Holloman  
**DATE/TIME:** 4/11/13

**RECEIVED BY:**  
**DATE/TIME:**

**COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:** MT-PIPER

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (codes below)	TOTAL CONTAINERS (refer to)	ANALYSIS REQUIRED INCLUDING SUITES (NB: Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).											Additional Information
						W-4 (TPH/TRH (C6-C36 or 40)/BTEXN)	W2 - Dissolved Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg) - W-2	EG020F - Additional Metals - Se, B, Fe, Mn	UTO-5W Phenols and PAH - Trace	VOC Scan	Cations - NT-1	Anions (incl F) - NT-2A	PCB				
1	M1-X-5/02	31/10/13	W	P, Ag, VS, H, N	6	X	X	X	X	X	X	X	X	X	X	X	Plastic unapproved not required
2	M1-X-5/03		W	P, Ag, VS, H, N	6	X	X	X	X	X	X	X	X	X	X	X	Plastic unapproved not required
3	M5-X-MWMPF		W	P, Ag, VS, H, N	6	X	X	X	X	X	X	X	X	X	X	X	Plastic unapproved not required
4	M5-X-MWMP05		W	P, Ag, VS, H, N	6	X	X	X	X	X	X	X	X	X	X	X	Plastic unapproved not required
5	M5-X-MWMP06		W	P, Ag, VS, H, N	6	X	X	X	X	X	X	X	X	X	X	X	Plastic unapproved not required
6	M5-X-5/08		W	P, Ag, VS, H, N	6	X	X	X	X	X	X	X	X	X	X	X	Plastic unapproved not required
7	M6-X-4/05	1/11/13	W	P, Ag, VS, H, N	6	X	X	X	X	X	X	X	X	X	X	X	Plastic unapproved not required
8	M6-X-4/D1	4/11/13	W	P, Ag, VS, H, N	6	X	X	X	X	X	X	X	X	X	X	X	Plastic unapproved not required
9	D02-GNS04113	4/11/13	W	P, Ag, VS, H, N	8	X	X	X	X	X	X	X	X	X	X	X	Plastic unapproved not required
10	RB-GW/3-311013	31/10/13	W	P, Ag, VS, H, N	6	X	X	X	X	X	X	X	X	X	X	X	Plastic unapproved not required
11	RB-GW/4-011113	01/11/13	W	P, Ag, VS, H, N	5	X	X	X	X	X	X	X	X	X	X	X	Plastic unapproved not required
<b>TOTAL</b>					75												

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Air-tight Unpreserved Plastic  
 V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Disulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Air-tight Unpreserved Vial; VG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;  
 Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Solids; B = Unpreserved Plastic



**CHAIN OF CUSTODY**  
ALS Laboratory:  
please tick ->

DATE/TIME: 21 Burma Road, Strathfield SA 5095  
Ph: 08 4330 4444 E: chainofcustody@als.com.au  
DARLENE 32 Prince Street, Strathfield QLD 4053  
Ph: 07 3243 7222 E: samples@darlene.com.au  
DGL LOSTON 46 Colman Road, Dawu QLD 4690  
Ph: 07 7471 5600 E: gordon@als.com.au

DMACKAY 78 Hartwood Road, Mackay QLD 4740  
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DUNELBOURNE 2-4 Metell Road, Springvale VIC 3171  
Ph: 03 8545 8600 E: samples@duelboorne.com.au  
DUNDEE 27 Sydney Road, Dundee NSW 2560  
Ph: 02 9372 7735 E: mudgee@als.com.au

DUNELBOURNE 5 Rose Gum Road, Warrackabea NSW 2394  
Ph: 02 4608 6433 E: samples@duelboorne.com.au  
DUNOYRA 413 Geary Place, North Sydney NSW 2061  
Ph: 02 4423 2063 E: dunoyra@als.com.au  
DUPRIN 10 Hood Way, Kalbar, WA 6000  
Ph: 08 9209 7855 E: samples@duprin.com.au

DUYDNEY 277-299 Woodpark Road, Smithfield NSW 2164  
Ph: 02 8794 6355 E: samples@duydney.com.au  
DUNOYRA 14-15 Deanna Court, Baulk Hills QLD 4818  
Ph: 07 4780 0600 E: lewre@als.com.au  
DUNOYRA 50 Kerry Street, Wollongong NSW 2500  
Ph: 02 4225 3125 E: polk@als.com.au

**FOR LABORATORY USE ONLY (CONT)**

Client/Analyst Initials	Yes	No	N/A
Sample ID/Matrix	Yes	No	N/A
Random Sample Taken on Receipt	Yes	No	N/A
Other Comments			

**CLIENT: ERM**

**OFFICE:** GROUND FLOOR, 33 SAUNDERS ST, PYRMONT NSW 2009

**PROJECT:** Wallerawang Mt Piper GW

**ORDER NUMBER:** 02074230207420

**PROJECT MANAGER:** Jonathan Lekawski

**CONTACT PH:**

**SAMPLER:** Dane Brookes/Skye Holloman

**SAMPLER MOBILE:** 0460918365

**COC emailed to ALS? (YES/NO):** (NO)

**EDD FORMAT (or default):** PDF/CVS/ESDAT

**Email Reports to (will default to RLD) to other addresses are listed:** Symphony.DelaWasa@erm.com

**Email Invoice to (will default to PM if no other addresses are listed):** Symphony.DelaWasa@erm.com

**COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:** MT. PIPER

**TURNAROUND REQUIREMENTS:**

Standard TAT (List due date):  Standard TAT (List due date):

Non Standard or urgent TAT (List due date):  Non Standard or urgent TAT (List due date):

**RECEIVED BY:** Steven

**DATE/TIME:** 5/11/17 9:00

COC SEQUENCE NUMBER (Circle)	1	2	3	4	5	6	7
COC:	1	2	3	4	5	6	7
OF:	1	2	3	4	5	6	7

**RECEIVED BY:**

**DATE/TIME:**

ALS USE	SAMPLE DETAILS MATRIX(SOLID(S)/WATER(LI))	CONTAINER INFORMATION	ANALYSIS REQUIRED (including SUITES (NB, Suite Codes must be listed to attract suite price) where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required))	Additional Information											
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below)	REFER TO	TOTAL CONTAINERS	W-4 (TPH/TRH (C6-C36or 40)/BTEXN	W2 - Dissolved Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg) - W-2	EG020F - Additional Metals - Se, B, Fe, Mn	UTO-5W Phenols and PAH - <del>Three</del> <del>Range</del>	VOC Scan	Cations - NT-1	Anions (incl F) - NT-2A	PCB	Comments on likely contaminant levels, dilutions or samples requiring specific QC analysis etc.
12	RB-GWS-041113	04/11/13	W	A9, V3, H, N		5	X	X	X	X					
13	TS	04/30/10/13	W	V3		2	X	X	X	X					
14	TB	30/10/13	W	V3		2	X	X	X	X					
<b>TOTAL</b>						59									

Water Container Codes: F = Unpreserved Plastic; N = Nitrite Preserved Plastic; ORC = Nitrite Preserved ORC; SF = Sodium Hydroxide/CaCl<sub>2</sub> Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic  
V = VOA Via HCl Preserved; VB = VOA Via Sodium Bisulphate Preserved; VS = VOA Via Sulphuric Preserved; AV = Airfreight Unpreserved Via; SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldenhyde Preserved Glass;  
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Solids; B = Unpreserved Bag.



## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>ES1324232</b> <b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : MR JONATHAN LEKAWSKI <b>Address</b> : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007  <b>E-mail</b> : jonathan.lekawski@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800 <b>Project</b> : WALLERAWANG MT PIPER GW <b>Order number</b> : 0207423/0207420 <b>C-O-C number</b> : ---- <b>Sampler</b> : D.BROOKES/S.HOLLOMAN <b>Site</b> : ----  <b>Quote number</b> : SY/278/13 V3	<b>Page</b> : 1 of 19  <b>Laboratory</b> : Environmental Division Sydney <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164  <b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555 <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement  <b>Date Samples Received</b> : 08-NOV-2013 <b>Issue Date</b> : 18-NOV-2013  <b>No. of samples received</b> : 15 <b>No. of samples analysed</b> : 15
--	--

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

### *Signatories*

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ashesh Patel	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EG020F: Positive results for sample ES1324232 # 003 have been confirmed by reanalysis.**
- **EN055: Ionic Balance out of acceptable limits for sample ID (TE\_MW16 & D03\_GW\_051113) due to analytes not quantified in this report.**
- **EP080: Sample TRIP SPIKE contains volatile compounds spiked into the sample containers prior to dispatch from the laboratory. BTEX compounds spiked at 20 ug/L.**
- **Total PAH reported as the sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene and Benzo(g,h,i)perylene.**



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				TE_MW15	TE_MW16	RB_GW6_051113	MH_X_D18	MA_X_5/D11
				05-NOV-2013 15:00	05-NOV-2013 15:00	05-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324232-001	ES1324232-002	ES1324232-003	ES1324232-004	ES1324232-005
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	206	83	<1	339	101
Total Alkalinity as CaCO3	----	1	mg/L	206	83	<1	339	101
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	70	93	<1	18	251
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	54	42	<1	9	12
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	42	11	<1	77	47
Magnesium	7439-95-4	1	mg/L	34	14	<1	31	50
Sodium	7440-23-5	1	mg/L	36	55	<1	15	21
Potassium	7440-09-7	1	mg/L	8	6	<1	19	8
<b>EG020F: Dissolved Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	0.002	0.007	<0.001	0.010	0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	<0.001	0.003	<0.001	<0.001	0.002
Nickel	7440-02-0	0.001	mg/L	0.040	0.020	<0.001	0.004	0.108
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	7440-66-6	0.005	mg/L	0.029	0.095	<0.005	<0.005	0.083
Manganese	7439-96-5	0.001	mg/L	7.59	6.82	0.001	0.144	1.75
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	<0.05	0.09	<0.05
Iron	7439-89-6	0.05	mg/L	59.8	32.5	0.11	3.03	8.46
<b>EG035F: Dissolved Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
<b>EK040P: Fluoride by PC Titrator</b>								
Fluoride	16984-48-8	0.1	mg/L	0.2	<0.1	<0.1	0.8	0.1
<b>EN055: Ionic Balance</b>								
Total Anions	----	0.01	meq/L	7.10	4.78	<0.01	7.40	7.58
Total Cations	----	0.01	meq/L	----	4.25	<0.01	7.53	7.58
Total Cations	----	0.01	meq/L	7.07	----	----	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

Compound	CAS Number	LOR	Unit	TE_MW15	TE_MW16	RB_GW6_051113	MH_X_D18	MA_X_5/D11
				05-NOV-2013 15:00	05-NOV-2013 15:00	05-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00
				ES1324232-001	ES1324232-002	ES1324232-003	ES1324232-004	ES1324232-005
<b>EN055: Ionic Balance - Continued</b>								
Ionic Balance	----	0.01	%	----	5.92	----	0.88	0.03
Ionic Balance	----	0.01	%	0.20	----	<0.01	----	----
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	1	µg/L	<1	<1	<1	----	<1
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	5	µg/L	<5	<5	<5	----	<5
Isopropylbenzene	98-82-8	5	µg/L	<5	<5	<5	----	<5
n-Propylbenzene	103-65-1	5	µg/L	<5	<5	<5	----	<5
1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	<5	----	<5
sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	<5	----	<5
1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	<5	----	<5
tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	<5	----	<5
p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	<5	----	<5
n-Butylbenzene	104-51-8	5	µg/L	<5	<5	<5	----	<5
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	50	µg/L	<50	<50	<50	----	<50
2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	<50	----	<50
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	<50	----	<50
2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	<50	----	<50
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	5	µg/L	<5	<5	<5	----	<5
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	<5	----	<5
1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	<5	----	<5
cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	<5	----	<5
trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	<5	----	<5
1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	<5	----	<5
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	<50	----	<50
Chloromethane	74-87-3	50	µg/L	<50	<50	<50	----	<50
Vinyl chloride	75-01-4	50	µg/L	<50	<50	<50	----	<50
Bromomethane	74-83-9	50	µg/L	<50	<50	<50	----	<50
Chloroethane	75-00-3	50	µg/L	<50	<50	<50	----	<50



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				TE_MW15	TE_MW16	RB_GW6_051113	MH_X_D18	MA_X_5/D11
				05-NOV-2013 15:00	05-NOV-2013 15:00	05-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324232-001	ES1324232-002	ES1324232-003	ES1324232-004	ES1324232-005
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	<50	----	<50
1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	<5	----	<5
Iodomethane	74-88-4	5	µg/L	<5	<5	<5	----	<5
trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	<5	----	<5
1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	<5	----	<5
cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	<5	----	<5
1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	<5	----	<5
1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	<5	----	<5
Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	<5	----	<5
1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	<5	----	<5
Trichloroethene	79-01-6	5	µg/L	<5	<5	<5	----	<5
Dibromomethane	74-95-3	5	µg/L	<5	<5	<5	----	<5
1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	<5	----	<5
1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	<5	----	<5
Tetrachloroethene	127-18-4	5	µg/L	<5	<5	<5	----	<5
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	<5	----	<5
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	<5	----	<5
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	<5	----	<5
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	<5	----	<5
1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	<5	----	<5
Pentachloroethane	76-01-7	5	µg/L	<5	<5	<5	----	<5
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	<5	----	<5
Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	<5	----	<5
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	5	µg/L	<5	<5	<5	----	<5
Bromobenzene	108-86-1	5	µg/L	<5	<5	<5	----	<5
2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	<5	----	<5
4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	<5	----	<5
1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	<5	----	<5
1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	<5	----	<5
1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	<5	----	<5
1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	<5	----	<5
1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	<5	----	<5



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				TE_MW15	TE_MW16	RB_GW6_051113	MH_X_D18	MA_X_5/D11
				05-NOV-2013 15:00	05-NOV-2013 15:00	05-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324232-001	ES1324232-002	ES1324232-003	ES1324232-004	ES1324232-005
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	5	µg/L	<5	<5	<5	----	<5
Bromodichloromethane	75-27-4	5	µg/L	<5	<5	<5	----	<5
Dibromochloromethane	124-48-1	5	µg/L	<5	<5	<5	----	<5
Bromoform	75-25-2	5	µg/L	<5	<5	<5	----	<5
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	7	µg/L	<7	<7	<7	----	<7
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5





## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				TE_MW15	TE_MW16	RB_GW6_051113	MH_X_D18	MA_X_5/D11
				05-NOV-2013 15:00	05-NOV-2013 15:00	05-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324232-001	ES1324232-002	ES1324232-003	ES1324232-004	ES1324232-005
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	390	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	680	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	1070	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	730	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	820	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	1550	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	62.4	62.6	64.6	----	63.8
<b>EP074S: VOC Surrogates</b>								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	117	120	118	----	120



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				TE_MW15	TE_MW16	RB_GW6_051113	MH_X_D18	MA_X_5/D11
				05-NOV-2013 15:00	05-NOV-2013 15:00	05-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324232-001	ES1324232-002	ES1324232-003	ES1324232-004	ES1324232-005
<b>EP074S: VOC Surrogates - Continued</b>								
Toluene-D8	2037-26-5	0.1	%	118	120	117	----	118
4-Bromofluorobenzene	460-00-4	0.1	%	113	109	109	----	108
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	26.6	21.9	27.2	31.0	28.8
2-Chlorophenol-D4	93951-73-6	0.1	%	61.4	51.1	65.9	72.3	72.2
2,4,6-Tribromophenol	118-79-6	0.1	%	76.8	85.0	76.8	86.7	80.2
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	81.4	69.4	85.8	96.8	89.1
Anthracene-d10	1719-06-8	0.1	%	68.9	74.8	76.4	80.2	76.8
4-Terphenyl-d14	1718-51-0	0.1	%	75.2	85.8	105	85.9	88.5
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	119	122	121	106	123
Toluene-D8	2037-26-5	0.1	%	123	125	122	108	122
4-Bromofluorobenzene	460-00-4	0.1	%	110	111	108	91.5	106



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MH_X_D15	TS	TB	D03_GW_051113	MG_X_4/D10
				06-NOV-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	05-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324232-006	ES1324232-007	ES1324232-008	ES1324232-009	ES1324232-010
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	83	40
Total Alkalinity as CaCO3	----	1	mg/L	<1	----	----	83	40
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1210	----	----	95	3020
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	76	----	----	40	583
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	177	----	----	12	331
Magnesium	7439-95-4	1	mg/L	79	----	----	14	260
Sodium	7440-23-5	1	mg/L	262	----	----	54	939
Potassium	7440-09-7	1	mg/L	30	----	----	6	121
<b>EG020F: Dissolved Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	0.007	<0.001
Cadmium	7440-43-9	0.0001	mg/L	0.0012	----	----	0.0001	0.0074
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	0.020	----	----	0.003	0.010
Nickel	7440-02-0	0.001	mg/L	0.887	----	----	0.020	0.857
Lead	7439-92-1	0.001	mg/L	0.022	----	----	<0.001	0.003
Zinc	7440-66-6	0.005	mg/L	2.30	----	----	0.102	1.52
Manganese	7439-96-5	0.001	mg/L	1.71	----	----	6.42	8.91
Selenium	7782-49-2	0.01	mg/L	<0.01	----	----	<0.01	<0.01
Boron	7440-42-8	0.05	mg/L	0.19	----	----	<0.05	4.15
Iron	7439-89-6	0.05	mg/L	21.4	----	----	33.0	8.61
<b>EG035F: Dissolved Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	<0.0001	<0.0001
<b>EK040P: Fluoride by PC Titrator</b>								
Fluoride	16984-48-8	0.1	mg/L	<0.1	----	----	<0.1	1.6
<b>EN055: Ionic Balance</b>								
Total Anions	----	0.01	meq/L	27.3	----	----	4.76	80.1
Total Cations	----	0.01	meq/L	27.5	----	----	4.25	81.8
Ionic Balance	----	0.01	%	0.29	----	----	5.69	1.06



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MH_X_D15	TS	TB	D03_GW_051113	MG_X_4/D10
				06-NOV-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	05-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324232-006	ES1324232-007	ES1324232-008	ES1324232-009	ES1324232-010
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	1	µg/L	----	----	----	<1	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	5	µg/L	----	----	----	<5	----
Isopropylbenzene	98-82-8	5	µg/L	----	----	----	<5	----
n-Propylbenzene	103-65-1	5	µg/L	----	----	----	<5	----
1,3,5-Trimethylbenzene	108-67-8	5	µg/L	----	----	----	<5	----
sec-Butylbenzene	135-98-8	5	µg/L	----	----	----	<5	----
1,2,4-Trimethylbenzene	95-63-6	5	µg/L	----	----	----	<5	----
tert-Butylbenzene	98-06-6	5	µg/L	----	----	----	<5	----
p-Isopropyltoluene	99-87-6	5	µg/L	----	----	----	<5	----
n-Butylbenzene	104-51-8	5	µg/L	----	----	----	<5	----
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	50	µg/L	----	----	----	<50	----
2-Butanone (MEK)	78-93-3	50	µg/L	----	----	----	<50	----
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	----	----	----	<50	----
2-Hexanone (MBK)	591-78-6	50	µg/L	----	----	----	<50	----
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	5	µg/L	----	----	----	<5	----
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	5	µg/L	----	----	----	<5	----
1,2-Dichloropropane	78-87-5	5	µg/L	----	----	----	<5	----
cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	----	----	----	<5	----
trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	----	----	----	<5	----
1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	----	----	----	<5	----
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	50	µg/L	----	----	----	<50	----
Chloromethane	74-87-3	50	µg/L	----	----	----	<50	----
Vinyl chloride	75-01-4	50	µg/L	----	----	----	<50	----
Bromomethane	74-83-9	50	µg/L	----	----	----	<50	----
Chloroethane	75-00-3	50	µg/L	----	----	----	<50	----
Trichlorofluoromethane	75-69-4	50	µg/L	----	----	----	<50	----
1,1-Dichloroethene	75-35-4	5	µg/L	----	----	----	<5	----
Iodomethane	74-88-4	5	µg/L	----	----	----	<5	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MH_X_D15	TS	TB	D03_GW_051113	MG_X_4/D10
				06-NOV-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	05-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324232-006	ES1324232-007	ES1324232-008	ES1324232-009	ES1324232-010
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
trans-1,2-Dichloroethene	156-60-5	5	µg/L	----	----	----	<5	----
1,1-Dichloroethane	75-34-3	5	µg/L	----	----	----	<5	----
cis-1,2-Dichloroethene	156-59-2	5	µg/L	----	----	----	<5	----
1,1,1-Trichloroethane	71-55-6	5	µg/L	----	----	----	<5	----
1,1-Dichloropropylene	563-58-6	5	µg/L	----	----	----	<5	----
Carbon Tetrachloride	56-23-5	5	µg/L	----	----	----	<5	----
1,2-Dichloroethane	107-06-2	5	µg/L	----	----	----	<5	----
Trichloroethene	79-01-6	5	µg/L	----	----	----	<5	----
Dibromomethane	74-95-3	5	µg/L	----	----	----	<5	----
1,1,2-Trichloroethane	79-00-5	5	µg/L	----	----	----	<5	----
1,3-Dichloropropane	142-28-9	5	µg/L	----	----	----	<5	----
Tetrachloroethene	127-18-4	5	µg/L	----	----	----	<5	----
1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	----	----	----	<5	----
trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	----	----	----	<5	----
cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	----	----	----	<5	----
1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	----	----	----	<5	----
1,2,3-Trichloropropane	96-18-4	5	µg/L	----	----	----	<5	----
Pentachloroethane	76-01-7	5	µg/L	----	----	----	<5	----
1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	----	----	----	<5	----
Hexachlorobutadiene	87-68-3	5	µg/L	----	----	----	<5	----
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	5	µg/L	----	----	----	<5	----
Bromobenzene	108-86-1	5	µg/L	----	----	----	<5	----
2-Chlorotoluene	95-49-8	5	µg/L	----	----	----	<5	----
4-Chlorotoluene	106-43-4	5	µg/L	----	----	----	<5	----
1,3-Dichlorobenzene	541-73-1	5	µg/L	----	----	----	<5	----
1,4-Dichlorobenzene	106-46-7	5	µg/L	----	----	----	<5	----
1,2-Dichlorobenzene	95-50-1	5	µg/L	----	----	----	<5	----
1,2,4-Trichlorobenzene	120-82-1	5	µg/L	----	----	----	<5	----
1,2,3-Trichlorobenzene	87-61-6	5	µg/L	----	----	----	<5	----
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	5	µg/L	----	----	----	<5	----
Bromodichloromethane	75-27-4	5	µg/L	----	----	----	<5	----
Dibromochloromethane	124-48-1	5	µg/L	----	----	----	<5	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MH_X_D15	TS	TB	D03_GW_051113	MG_X_4/D10
				06-NOV-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	05-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324232-006	ES1324232-007	ES1324232-008	ES1324232-009	ES1324232-010
<b>EP074G: Trihalomethanes - Continued</b>								
Bromoform	75-25-2	5	µg/L	----	----	----	<5	----
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	7	µg/L	----	----	----	<7	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	1.0	µg/L	<1.0	----	----	<1.0	<1.0
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	----	----	<1.0	<1.0
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	----	----	<1.0	<1.0
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	----	----	<2.0	<2.0
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	----	----	<1.0	<1.0
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	----	----	<1.0	<1.0
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	----	----	<1.0	<1.0
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	----	----	<1.0	<1.0
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	----	----	<1.0	<1.0
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	----	----	<1.0	<1.0
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	----	----	<1.0	<1.0
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	----	----	<2.0	<2.0
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	1.0	µg/L	<1.0	----	----	<1.0	<1.0
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	----	----	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L	<1.0	----	----	<1.0	<1.0
Fluorene	86-73-7	1.0	µg/L	<1.0	----	----	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L	<1.0	----	----	<1.0	<1.0
Anthracene	120-12-7	1.0	µg/L	<1.0	----	----	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L	<1.0	----	----	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L	<1.0	----	----	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	----	----	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L	<1.0	----	----	<1.0	<1.0
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	----	----	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	----	----	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	----	----	<1.0	<1.0
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	----	----	<1.0	<1.0
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	----	----	<1.0	<1.0





## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MH_X_D15	TS	TB	D03_GW_051113	MG_X_4/D10
				06-NOV-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	05-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324232-006	ES1324232-007	ES1324232-008	ES1324232-009	ES1324232-010
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	----	----	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	----	----	<0.5	<0.5
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	20	µg/L	<20	----	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	----	----	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	----	----	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	----	----	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	----	<20	<20	<20
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	----	----	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	----	----	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	----	----	<100	<100
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	<1	16	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	16	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	16	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	16	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	18	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	34	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	82	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	20	<5	<5	<5
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	----	----	----	62.1	----
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	----	----	121	----
Toluene-D8	2037-26-5	0.1	%	----	----	----	116	----
4-Bromofluorobenzene	460-00-4	0.1	%	----	----	----	107	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				MH_X_D15	TS	TB	D03_GW_051113	MG_X_4/D10
				06-NOV-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	05-NOV-2013 15:00	06-NOV-2013 15:00
				ES1324232-006	ES1324232-007	ES1324232-008	ES1324232-009	ES1324232-010
Compound	CAS Number	LOR	Unit					
<b>EP075(SIM)S: Phenolic Compound Surrogates - Continued</b>								
Phenol-d6	13127-88-3	0.1	%	16.7	----	----	22.8	28.7
2-Chlorophenol-D4	93951-73-6	0.1	%	23.8	----	----	55.7	67.4
2,4,6-Tribromophenol	118-79-6	0.1	%	57.4	----	----	67.6	69.3
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	42.6	----	----	72.8	82.6
Anthracene-d10	1719-06-8	0.1	%	55.9	----	----	63.3	73.6
4-Terphenyl-d14	1718-51-0	0.1	%	65.3	----	----	82.0	92.0
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	115	119	93.1	123	111
Toluene-D8	2037-26-5	0.1	%	118	110	80.2	121	114
4-Bromofluorobenzene	460-00-4	0.1	%	102	118	96.0	106	93.1



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MG_X_4/D9	MG_X_4/D3	TS	TB	RB_GW7_061113
				07-NOV-2013 15:00	07-NOV-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324232-011	ES1324232-012	ES1324232-013	ES1324232-014	ES1324232-015
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	----	----	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	68	89	----	----	<1
Total Alkalinity as CaCO3	----	1	mg/L	68	89	----	----	<1
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1390	424	----	----	<1
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	203	33	----	----	<1
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	234	96	----	----	<1
Magnesium	7439-95-4	1	mg/L	174	55	----	----	<1
Sodium	7440-23-5	1	mg/L	213	44	----	----	<1
Potassium	7440-09-7	1	mg/L	17	10	----	----	<1
<b>EG020F: Dissolved Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	----	----	<0.001
Cadmium	7440-43-9	0.0001	mg/L	0.0003	<0.0001	----	----	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	----	----	<0.001
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	----	----	<0.001
Nickel	7440-02-0	0.001	mg/L	0.354	0.022	----	----	<0.001
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	----	----	<0.001
Zinc	7440-66-6	0.005	mg/L	0.104	0.017	----	----	<0.005
Manganese	7439-96-5	0.001	mg/L	10.2	1.18	----	----	<0.001
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	----	----	<0.01
Boron	7440-42-8	0.05	mg/L	0.56	<0.05	----	----	<0.05
Iron	7439-89-6	0.05	mg/L	30.2	15.1	----	----	<0.05
<b>EG035F: Dissolved Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	----	----	<0.0001
<b>EK040P: Fluoride by PC Titrator</b>								
Fluoride	16984-48-8	0.1	mg/L	0.1	<0.1	----	----	<0.1
<b>EN055: Ionic Balance</b>								
Total Anions	----	0.01	meq/L	36.0	11.5	----	----	<0.01
Total Cations	----	0.01	meq/L	35.7	11.5	----	----	<0.01
Ionic Balance	----	0.01	%	0.46	0.21	----	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

Compound	CAS Number	LOR	Unit	MG_X_4/D9	MG_X_4/D3	TS	TB	RB_GW7_061113
				07-NOV-2013 15:00	07-NOV-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	06-NOV-2013 15:00
				ES1324232-011	ES1324232-012	ES1324232-013	ES1324232-014	ES1324232-015
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	----	----	<1.0
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	----	----	<1.0
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	----	----	<1.0
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	----	----	<2.0
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	----	----	<1.0
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	----	----	<1.0
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	----	----	<1.0
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	----	----	<1.0
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	----	----	<1.0
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	----	----	<1.0
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	----	----	<1.0
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	----	----	<2.0
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	----	----	<1.0
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	----	----	<1.0
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	----	----	<1.0
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	----	----	<1.0
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	----	----	<1.0
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	----	----	<1.0
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	----	----	<1.0
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	----	----	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	----	----	<1.0
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	----	----	<1.0
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	----	----	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	----	----	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	----	----	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	----	----	<1.0
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	----	----	<1.0
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	----	----	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	----	----	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	----	----	<0.5
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	20	µg/L	<20	<20	----	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	----	----	<50



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MG_X_4/D9	MG_X_4/D3	TS	TB	RB_GW7_061113
				07-NOV-2013 15:00	07-NOV-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324232-011	ES1324232-012	ES1324232-013	ES1324232-014	ES1324232-015
<b>EP080/071: Total Petroleum Hydrocarbons - Continued</b>								
C15 - C28 Fraction	----	100	µg/L	<100	<100	----	----	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	----	----	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	----	----	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	----	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	----	<20	<20
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	----	----	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	----	----	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	----	----	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	----	----	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	----	----	<100
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	<1	<1	15	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	15	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	16	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	16	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	18	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	34	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	80	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	19	<5	<5
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	22.8	23.6	----	----	24.3
2-Chlorophenol-D4	93951-73-6	0.1	%	64.6	66.2	----	----	60.9
2,4,6-Tribromophenol	118-79-6	0.1	%	68.6	68.0	----	----	49.8
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	84.6	86.7	----	----	81.0
Anthracene-d10	1719-06-8	0.1	%	72.4	75.4	----	----	70.3
4-Terphenyl-d14	1718-51-0	0.1	%	74.1	78.6	----	----	71.6
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	105	128	86.7	99.0	128
Toluene-D8	2037-26-5	0.1	%	100	127	99.4	86.4	121
4-Bromofluorobenzene	460-00-4	0.1	%	84.9	109	104	104	104



**Analytical Results**

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sample ID	MG_X_4/D9	MG_X_4/D3	TS	TB	RB_GW7_061113
Client sampling date / time	07-NOV-2013 15:00	07-NOV-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	06-NOV-2013 15:00
Compound	ES1324232-011	ES1324232-012	ES1324232-013	ES1324232-014	ES1324232-015

CAS Number LOR Unit

EP080S: TPH(V)/BTEX Surrogates - Continued





## Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP066S: PCB Surrogate</b>			
Decachlorobiphenyl	2051-24-3	28.5	129
<b>EP074S: VOC Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	78.3	133.2
Toluene-D8	2037-26-5	79.1	128.9
4-Bromofluorobenzene	460-00-4	80.8	123.7
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	10.0	44
2-Chlorophenol-D4	93951-73-6	14	94
2,4,6-Tribromophenol	118-79-6	17	125
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27.4	113
4-Terphenyl-d14	1718-51-0	32	112
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: ES1324232</b>	<b>Page</b>	: 1 of 20
<b>Client</b>	<b>: ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	<b>: MR JONATHAN LEKAWSKI</b>	<b>Contact</b>	: Barbara Hanna
<b>Address</b>	<b>: GROUND FLOOR</b> <b>33 SAUNDERS STREET, PYRMONT NSW 2009</b> <b>LOCKED BAG 24</b> <b>BROADWAY NSW, AUSTRALIA 2007</b>	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	<b>: jonathan.lekawski@erm.com</b>	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	<b>: +61 02 8584 8888</b>	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	<b>: +61 02 8584 8800</b>	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	<b>: WALLERAWANG MT PIPER GW</b>	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b>	<b>: ----</b>	<b>Date Samples Received</b>	: 08-NOV-2013
<b>C-O-C number</b>	<b>: ----</b>	<b>Issue Date</b>	: 18-NOV-2013
<b>Sampler</b>	<b>: D.BROOKES/S.HOLLOMAN</b>	<b>No. of samples received</b>	: 15
<b>Order number</b>	<b>: 0207423/0207420</b>	<b>No. of samples analysed</b>	: 15
<b>Quote number</b>	<b>: SY/278/13 V3</b>		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ashesh Patel	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics



### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :            Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
                  CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
                  LOR = Limit of reporting  
                  RPD = Relative Percentage Difference  
                  # = Indicates failed QC



### Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>ED037P: Alkalinity by PC Titrator (QC Lot: 3152360)</b>									
ES1324230-006	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	36	36	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	36	36	0.0	0% - 20%
ES1324232-009	D03_GW_051113	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	96	100	4.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	96	100	4.3	0% - 20%
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3150179)</b>									
ES1324232-001	TE_MW15	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	70	71	0.0	0% - 20%
ES1324232-010	MG_X_4/D10	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	3020	3060	1.4	0% - 20%
<b>ED045G: Chloride Discrete analyser (QC Lot: 3150178)</b>									
ES1324232-001	TE_MW15	ED045G: Chloride	16887-00-6	1	mg/L	54	55	2.1	0% - 20%
ES1324232-010	MG_X_4/D10	ED045G: Chloride	16887-00-6	1	mg/L	583	586	0.5	0% - 20%
<b>ED093F: Dissolved Major Cations (QC Lot: 3150177)</b>									
ES1324212-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	2	2	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	2	2	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	8	8	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	1	1	0.0	No Limit
ES1324232-011	MG_X_4/D9	ED093F: Calcium	7440-70-2	1	mg/L	234	235	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	174	175	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	213	213	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	17	17	0.0	0% - 50%
<b>EG020F: Dissolved Metals by ICP-MS (QC Lot: 3155542)</b>									
ES1324134-003	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0450	0.0450	0.0	0% - 20%
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.014	0.013	0.0	0% - 50%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.007	0.005	22.2	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	0.171	0.169	0.8	0% - 20%
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.408	0.440	7.6	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.012	0.013	0.0	0% - 50%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	1.01	0.871	15.0	0% - 20%
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	0.05	0.05	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	0.14	0.16	15.2	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.09	0.10	13.2	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG020F: Dissolved Metals by ICP-MS (QC Lot: 3155542) - continued</b>									
ES1324232-006	MH_X_D15	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0012	0.0012	0.0	0% - 50%
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.020	0.020	0.0	0% - 20%
		EG020A-F: Lead	7439-92-1	0.001	mg/L	0.022	0.021	0.0	0% - 20%
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	1.71	1.73	0.9	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.887	0.839	5.6	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	2.30	2.27	1.3	0% - 20%
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	0.19	0.20	6.7	No Limit
EG020A-F: Iron	7439-89-6	0.05	mg/L	21.4	20.1	6.4	0% - 20%		
<b>EG035F: Dissolved Mercury by FIMS (QC Lot: 3155541)</b>									
ES1324134-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1324232-005	MA_X_5/D11	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
<b>EK040P: Fluoride by PC Titrator (QC Lot: 3152356)</b>									
ES1324006-001	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.2	0.2	0.0	No Limit
ES1324231-002	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.2	0.2	0.0	No Limit
<b>EK040P: Fluoride by PC Titrator (QC Lot: 3152361)</b>									
ES1324232-009	D03_GW_051113	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
ES1324291-016	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.4	0.4	0.0	No Limit
<b>EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 3152088)</b>									
ES1324232-002	TE_MW16	EP066: Total Polychlorinated biphenyls	----	1	µg/L	<1	<1	0.0	No Limit
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3154402)</b>									
ES1324232-001	TE_MW15	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
		ES1324404-001	Anonymous	EP074: Styrene	100-42-5	5	µg/L	<5	<5
EP074: Isopropylbenzene	98-82-8			5	µg/L	<5	<5	0.0	No Limit
EP074: n-Propylbenzene	103-65-1			5	µg/L	<5	<5	0.0	No Limit
EP074: 1,3,5-Trimethylbenzene	108-67-8			5	µg/L	<5	<5	0.0	No Limit
EP074: sec-Butylbenzene	135-98-8			5	µg/L	<5	<5	0.0	No Limit
EP074: 1,2,4-Trimethylbenzene	95-63-6			5	µg/L	<5	<5	0.0	No Limit
EP074: tert-Butylbenzene	98-06-6			5	µg/L	<5	<5	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3154402) - continued</b>									
ES1324404-001	Anonymous	EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
<b>EP074B: Oxygenated Compounds (QC Lot: 3154402)</b>									
ES1324232-001	TE_MW15	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
ES1324404-001	Anonymous	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
<b>EP074C: Sulfonated Compounds (QC Lot: 3154402)</b>									
ES1324232-001	TE_MW15	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
ES1324404-001	Anonymous	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
<b>EP074D: Fumigants (QC Lot: 3154402)</b>									
ES1324232-001	TE_MW15	EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
ES1324404-001	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3154402)</b>									
ES1324232-001	TE_MW15	EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit





Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3154402) - continued</b>									
ES1324232-001	TE_MW15	EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit
ES1324404-001	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3154402) - continued</b>									
ES1324404-001	Anonymous	EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3154402)</b>									
ES1324232-001	TE_MW15	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
ES1324404-001	Anonymous	EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
ES1324404-001	Anonymous	EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
ES1324404-001	Anonymous	EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit
		EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit
<b>EP074H: Naphthalene (QC Lot: 3154402)</b>									
ES1324232-001	TE_MW15	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit
ES1324404-001	Anonymous	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3152090)</b>									
ES1324232-002	TE_MW16	EP075(SIM): Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3152090) - continued</b>									
ES1324232-002	TE_MW16	EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	0.0	No Limit
ES1324232-009	D03_GW_051113	EP075(SIM): Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	0.0	No Limit
		<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3152090)</b>							
ES1324232-002	TE_MW16	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
ES1324232-009	D03_GW_051113	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3152090) - continued</b>									
ES1324232-009	D03_GW_051113	EP075(SIM): Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit		
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3152089)</b>									
ES1324232-002	TE_MW16	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
ES1324232-009	D03_GW_051113	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3152286)</b>									
ES1324211-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1324211-012	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3154403)</b>									
ES1324232-001	TE_MW15	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1324404-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	40	40	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3152089)</b>									
ES1324232-002	TE_MW16	EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
ES1324232-009	D03_GW_051113	EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3152286)</b>									
ES1324211-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES1324211-012	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3154403)</b>									
ES1324232-001	TE_MW15	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES1324404-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	40	40	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3152286)</b>									
ES1324211-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP080: BTEXN (QC Lot: 3152286) - continued</b>									
ES1324211-001	Anonymous	EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES1324211-012	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3154403)</b>									
ES1324232-001	TE_MW15	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES1324404-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit



### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>ED037P: Alkalinity by PC Titrator (QCLot: 3152360)</b>									
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	----	200 mg/L	93.8	81	111	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3150179)</b>									
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	104	86	122	
<b>ED045G: Chloride Discrete analyser (QCLot: 3150178)</b>									
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	99.5	77	123	
<b>ED093F: Dissolved Major Cations (QCLot: 3150177)</b>									
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	97.3	87	113	
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	95.7	89	113	
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	91.9	79	113	
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.0	87	115	
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3155542)</b>									
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	96.4	80	118	
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	96.4	82	112	
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.2	81	111	
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	97.4	80	112	
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	97.4	83	111	
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	99.3	81	113	
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	99.4	81	113	
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	99.0	73	125	
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	91.9	80	116	
EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.1 mg/L	104	69	123	
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	87.2	77	115	
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3155541)</b>									
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	106	78	114	
<b>EK040P: Fluoride by PC Titrator (QCLot: 3152356)</b>									
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5.0 mg/L	116	75	119	
<b>EK040P: Fluoride by PC Titrator (QCLot: 3152361)</b>									
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5.0 mg/L	118	75	119	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3152088)</b>									
EP066: Total Polychlorinated biphenyls	----	1	µg/L	<1	10 µg/L	105	61.6	107	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3154402)</b>									
EP074: Styrene	100-42-5	5	µg/L	<5	10 µg/L	91.7	74	118	
EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	10 µg/L	101	75	121	





Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3154402) - continued</b>									
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	10 µg/L	103	67	123	
EP074: 1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	10 µg/L	108	70	122	
EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	10 µg/L	106	69	123	
EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	10 µg/L	105	71	121	
EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	10 µg/L	98.6	70	122	
EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	10 µg/L	102	67	123	
EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	10 µg/L	105	62	126	
<b>EP074B: Oxygenated Compounds (QCLot: 3154402)</b>									
EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	100 µg/L	110	61.4	134	
EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	100 µg/L	101	73.6	130	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	100 µg/L	107	61	139	
EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	100 µg/L	111	65	137	
<b>EP074C: Sulfonated Compounds (QCLot: 3154402)</b>									
EP074: Carbon disulfide	75-15-0	5	µg/L	<5	10 µg/L	104	72.8	127	
<b>EP074D: Fumigants (QCLot: 3154402)</b>									
EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	10 µg/L	98.7	61	119	
EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	10 µg/L	103	76	120	
EP074: cis-1,3-Dichloropropylene	10061-01-5	10	µg/L	<10	10 µg/L	89.6	62	120	
EP074: trans-1,3-Dichloropropylene	10061-02-6	10	µg/L	<10	10 µg/L	90.7	61	119	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	10 µg/L	101	69	117	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3154402)</b>									
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	100 µg/L	76.8	60.6	138	
EP074: Chloromethane	74-87-3	50	µg/L	<50	100 µg/L	92.0	67.4	130	
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	100 µg/L	89.4	69.4	129	
EP074: Bromomethane	74-83-9	50	µg/L	<50	100 µg/L	100	56	140	
EP074: Chloroethane	75-00-3	50	µg/L	<50	100 µg/L	109	63	135	
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	100 µg/L	110	65	131	
EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	10 µg/L	102	69	123	
EP074: Iodomethane	74-88-4	5	µg/L	<5	10 µg/L	101	70.2	128	
EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	10 µg/L	103	71	119	
EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	10 µg/L	107	75	119	
EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	10 µg/L	98.8	77	117	
EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	10 µg/L	99.8	61	119	
EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	10 µg/L	95.7	73	119	
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	10 µg/L	93.7	63	121	
EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	10 µg/L	112	78	122	
EP074: Trichloroethene	79-01-6	5	µg/L	<5	10 µg/L	102	74	120	
EP074: Dibromomethane	74-95-3	5	µg/L	<5	10 µg/L	108	74	118	



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3154402) - continued</b>									
EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	10 µg/L	104	75	123	
EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	10 µg/L	106	79	121	
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	10 µg/L	94.3	72	124	
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	10 µg/L	89.9	66	114	
EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	10 µg/L	96.5	60	120	
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	10 µg/L	93.1	70.6	128	
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	10 µg/L	107	70	124	
EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	10 µg/L	102	74	128	
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	10 µg/L	86.1	71.8	126	
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	10 µg/L	106	66.4	136	
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	10 µg/L	107	58	132	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3154402)</b>									
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	10 µg/L	102	80	118	
EP074: Bromobenzene	108-86-1	5	µg/L	<5	10 µg/L	101	76	116	
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	10 µg/L	106	71	121	
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	10 µg/L	108	71	121	
EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	10 µg/L	102	74	120	
EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	10 µg/L	97.7	72	120	
EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	10 µg/L	102	77	117	
EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	10 µg/L	97.8	60	126	
EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	10 µg/L	98.8	67	125	
<b>EP074G: Trihalomethanes (QCLot: 3154402)</b>									
EP074: Chloroform	67-66-3	5	µg/L	<5	10 µg/L	102	76	118	
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	10 µg/L	93.7	64	118	
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	10 µg/L	98.0	65	115	
EP074: Bromoform	75-25-2	5	µg/L	<5	10 µg/L	95.0	73.5	126	
<b>EP074H: Naphthalene (QCLot: 3154402)</b>									
EP074: Naphthalene	91-20-3	7	µg/L	<7	10 µg/L	97.2	61	125	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3152090)</b>									
EP075(SIM): Phenol	108-95-2	0.2	µg/L	----	5 µg/L	37.8	24.5	61.9	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Chlorophenol	95-57-8	0.2	µg/L	----	5 µg/L	66.7	63.8	110	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Methylphenol	95-48-7	0.2	µg/L	----	5 µg/L	64.1	55.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	0.4	µg/L	----	10 µg/L	62.6	42.5	114	
		2	µg/L	<2.0	----	----	----	----	
EP075(SIM): 2-Nitrophenol	88-75-5	0.2	µg/L	----	5 µg/L	69.3	62.7	117	
		1	µg/L	<1.0	----	----	----	----	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3152090) - continued</b>									
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.2	µg/L	----	5 µg/L	68.2	59.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.2	µg/L	----	5 µg/L	67.4	59.3	122	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.2	µg/L	----	5 µg/L	69.2	64.3	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.2	µg/L	----	5 µg/L	64.6	63	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.2	µg/L	----	5 µg/L	71.6	58.7	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.2	µg/L	----	5 µg/L	66.0	50	108	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Pentachlorophenol	87-86-5	0.4	µg/L	----	10 µg/L	55.0	8.7	95	
		2	µg/L	<2.0	----	----	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3152090)</b>									
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	5 µg/L	67.3	58.6	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	5 µg/L	71.8	63.6	114	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	5 µg/L	69.7	62.2	113	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	5 µg/L	71.5	63.9	115	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	5 µg/L	63.3	62.6	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	5 µg/L	69.4	64.3	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	5 µg/L	71.7	63.6	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	5 µg/L	69.8	63.1	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	5 µg/L	68.2	64.1	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	5 µg/L	68.5	62.5	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	5 µg/L	65.9	61.7	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	5 µg/L	83.5	61.7	117	
		1	µg/L	<1.0	----	----	----	----	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3152090) - continued</b>									
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	5 µg/L	67.9	63.3	117	
		0.5	µg/L	<0.5	----	----	----	----	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	5 µg/L	83.1	59.9	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	----	5 µg/L	88.9	61.2	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	----	5 µg/L	71.6	59.1	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	1	µg/L	<1.0	----	----	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3152089)</b>									
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	101	59	129	
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	101	71	131	
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	94.8	62	120	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3152286)</b>									
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	76.9	75	127	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3154403)</b>									
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	108	75	127	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3152089)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	2500 µg/L	104	58.9	131	
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	99.4	73.9	138	
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----	
		50	µg/L	----	1500 µg/L	104	67	127	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3152286)</b>									
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	87.3	75	127	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3154403)</b>									
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	108	75	127	
<b>EP080: BTEXN (QCLot: 3152286)</b>									
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	86.9	70	124	
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	85.8	65	129	
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	101	70	120	
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	92.2	69	121	
	106-42-3								
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	108	72	122	
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	99.6	70	124	
<b>EP080: BTEXN (QCLot: 3154403)</b>									
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	116	70	124	
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	112	65	129	
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	108	70	120	



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
						LCS	Low	High
<b>EP080: BTEXN (QCLot: 3154403) - continued</b>								
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	104	69	121
	106-42-3							
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	112	72	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	104	70	124

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%)	Recovery Limits (%)	
					MS	Low	High
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3150179)</b>							
ES1324232-001	TE_MW15	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130
<b>ED045G: Chloride Discrete analyser (QCLot: 3150178)</b>							
ES1324232-001	TE_MW15	ED045G: Chloride	16887-00-6	250 mg/L	98.4	70	130
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3155542)</b>							
ES1324134-004	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	121	70	130
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	118	70	130
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	126	70	130
		EG020A-F: Copper	7440-50-8	0.2 mg/L	115	70	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	114	70	130
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	122	70	130
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	122	70	130
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	86.6	70	130
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3155541)</b>							
ES1324134-002	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	79.5	70	130
<b>EK040P: Fluoride by PC Titrator (QCLot: 3152356)</b>							
ES1324006-001	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	95.2	70	130
<b>EK040P: Fluoride by PC Titrator (QCLot: 3152361)</b>							
ES1324232-012	MG_X_4/D3	EK040P: Fluoride	16984-48-8	5.0 mg/L	113	70	130
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3152088)</b>							
ES1324232-002	TE_MW16	EP066: Total Polychlorinated biphenyls	----	10 µg/L	99.3	70	130
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3154402)</b>							
ES1324232-001	TE_MW15	EP074: 1,1-Dichloroethene	75-35-4	25 µg/L	113	70	130
		EP074: Trichloroethene	79-01-6	25 µg/L	107	70	130



Sub-Matrix: WATER

				Matrix Spike (MS) Report				
				Spike	SpikeRecovery(%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3154402)</b>								
ES1324232-001	TE_MW15	EP074: Chlorobenzene	108-90-7	25 µg/L	112	70	130	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3152090)</b>								
ES1324232-002	TE_MW16	EP075(SIM): Phenol	108-95-2	20 µg/L	52.4	20	130	
		EP075(SIM): 2-Chlorophenol	95-57-8	20 µg/L	91.5	60	130	
		EP075(SIM): 2-Nitrophenol	88-75-5	20 µg/L	97.5	60	130	
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	20 µg/L	104	70	130	
		EP075(SIM): Pentachlorophenol	87-86-5	20 µg/L	111	20	130	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3152090)</b>								
ES1324232-002	TE_MW16	EP075(SIM): Acenaphthene	83-32-9	20 µg/L	95.5	70	130	
		EP075(SIM): Pyrene	129-00-0	20 µg/L	88.0	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3152089)</b>								
ES1324232-002	TE_MW16	EP071: C10 - C14 Fraction	----	200 µg/L	114	74	150	
		EP071: C15 - C28 Fraction	----	300 µg/L	96.5	77	153	
		EP071: C29 - C36 Fraction	----	200 µg/L	116	67	153	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3152286)</b>								
ES1324211-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	98.8	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3154403)</b>								
ES1324232-001	TE_MW15	EP080: C6 - C9 Fraction	----	325 µg/L	103	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3152089)</b>								
ES1324232-002	TE_MW16	EP071: >C10 - C16 Fraction	>C10_C16	250 µg/L	108	74	150	
		EP071: >C16 - C34 Fraction	----	350 µg/L	112	77	153	
		EP071: >C34 - C40 Fraction	----	150 µg/L	129	67	153	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3152286)</b>								
ES1324211-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	97.6	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3154403)</b>								
ES1324232-001	TE_MW15	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	103	70	130	
<b>EP080: BTEXN (QCLot: 3152286)</b>								
ES1324211-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	77.8	70	130	
		EP080: Toluene	108-88-3	25 µg/L	73.1	70	130	
		EP080: Ethylbenzene	100-41-4	25 µg/L	82.0	70	130	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	89.4	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	25 µg/L	101	70	130	
EP080: Naphthalene	91-20-3	25 µg/L	96.2	70	130			
<b>EP080: BTEXN (QCLot: 3154403)</b>								
ES1324232-001	TE_MW15	EP080: Benzene	71-43-2	25 µg/L	122	70	130	





Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EP080: BTEXN (QCLot: 3154403) - continued</b>							
ES1324232-001	TE_MW15	EP080: Toluene	108-88-3	25 µg/L	113	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	120	70	130
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	119	70	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	25 µg/L	125	70	130
		EP080: Naphthalene	91-20-3	25 µg/L	111	70	130

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
<b>ED045G: Chloride Discrete analyser (QCLot: 3150178)</b>										
ES1324232-001	TE_MW15	ED045G: Chloride	16887-00-6	250 mg/L	98.4	----	70	130	----	----
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3150179)</b>										
ES1324232-001	TE_MW15	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	----	70	130	----	----
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3152088)</b>										
ES1324232-002	TE_MW16	EP066: Total Polychlorinated biphenyls	----	10 µg/L	99.3	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3152089)</b>										
ES1324232-002	TE_MW16	EP071: C10 - C14 Fraction	----	200 µg/L	114	----	74	150	----	----
		EP071: C15 - C28 Fraction	----	300 µg/L	96.5	----	77	153	----	----
		EP071: C29 - C36 Fraction	----	200 µg/L	116	----	67	153	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3152089)</b>										
ES1324232-002	TE_MW16	EP071: >C10 - C16 Fraction	>C10_C16	250 µg/L	108	----	74	150	----	----
		EP071: >C16 - C34 Fraction	----	350 µg/L	112	----	77	153	----	----
		EP071: >C34 - C40 Fraction	----	150 µg/L	129	----	67	153	----	----
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3152090)</b>										
ES1324232-002	TE_MW16	EP075(SIM): Phenol	108-95-2	20 µg/L	52.4	----	20	130	----	----
		EP075(SIM): 2-Chlorophenol	95-57-8	20 µg/L	91.5	----	60	130	----	----
		EP075(SIM): 2-Nitrophenol	88-75-5	20 µg/L	97.5	----	60	130	----	----
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	20 µg/L	104	----	70	130	----	----
		EP075(SIM): Pentachlorophenol	87-86-5	20 µg/L	111	----	20	130	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3152090)</b>										
ES1324232-002	TE_MW16	EP075(SIM): Acenaphthene	83-32-9	20 µg/L	95.5	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	20 µg/L	88.0	----	70	130	----	----



Sub-Matrix: WATER

Laboratory sample ID					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
						MS	MSD	Low	High	Value	Control Limit
Client sample ID	Method: Compound	CAS Number									
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3152286)</b>											
ES1324211-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	98.8	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3152286)</b>											
ES1324211-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	97.6	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3152286)</b>											
ES1324211-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	77.8	----	70	130	----	----	
		EP080: Toluene	108-88-3	25 µg/L	73.1	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	25 µg/L	82.0	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	89.4	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	25 µg/L	101	----	70	130	----	----	
	EP080: Naphthalene	91-20-3		25 µg/L	96.2	----	70	130	----	----	
<b>EK040P: Fluoride by PC Titrator (QCLot: 3152356)</b>											
ES1324006-001	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	95.2	----	70	130	----	----	
<b>EK040P: Fluoride by PC Titrator (QCLot: 3152361)</b>											
ES1324232-012	MG_X_4/D3	EK040P: Fluoride	16984-48-8	5.0 mg/L	113	----	70	130	----	----	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3154402)</b>											
ES1324232-001	TE_MW15	EP074: 1,1-Dichloroethene	75-35-4	25 µg/L	113	----	70	130	----	----	
		EP074: Trichloroethene	79-01-6	25 µg/L	107	----	70	130	----	----	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3154402)</b>											
ES1324232-001	TE_MW15	EP074: Chlorobenzene	108-90-7	25 µg/L	112	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3154403)</b>											
ES1324232-001	TE_MW15	EP080: C6 - C9 Fraction	----	325 µg/L	103	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3154403)</b>											
ES1324232-001	TE_MW15	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	103	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3154403)</b>											
ES1324232-001	TE_MW15	EP080: Benzene	71-43-2	25 µg/L	122	----	70	130	----	----	
		EP080: Toluene	108-88-3	25 µg/L	113	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	25 µg/L	120	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	119	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	25 µg/L	125	----	70	130	----	----	
	EP080: Naphthalene	91-20-3		25 µg/L	111	----	70	130	----	----	
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3155541)</b>											
ES1324134-002	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	79.5	----	70	130	----	----	
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3155542)</b>											
ES1324134-004	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	121	----	70	130	----	----	
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	118	----	70	130	----	----	



Sub-Matrix: **WATER**

				<i>Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report</i>						
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>Spike</i>	<i>Spike Recovery (%)</i>		<i>Recovery Limits (%)</i>		<i>RPDs (%)</i>	
				<i>Concentration</i>	<i>MS</i>	<i>MSD</i>	<i>Low</i>	<i>High</i>	<i>Value</i>	<i>Control Limit</i>
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3155542) - continued</b>										
ES1324134-004	Anonymous	EG020A-F: Chromium	7440-47-3	0.2 mg/L	126	----	70	130	----	----
		EG020A-F: Copper	7440-50-8	0.2 mg/L	115	----	70	130	----	----
		EG020A-F: Lead	7439-92-1	0.2 mg/L	114	----	70	130	----	----
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	122	----	70	130	----	----
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	122	----	70	130	----	----
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	86.6	----	70	130	----	----

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1324232</b>	Page	: 1 of 11
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: WALLERAWANG MT PIPER GW	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 08-NOV-2013
C-O-C number	: ----	Issue Date	: 18-NOV-2013
Sampler	: D.BROOKES/S.HOLLOMAN	No. of samples received	: 15
Order number	: 0207423/0207420	No. of samples analysed	: 15
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER** Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>ED037P: Alkalinity by PC Titrator</b>								
<b>Clear Plastic Bottle - Natural (ED037-P)</b> TE_MW15, RB_GW6_051113,	TE_MW16, D03_GW_051113	05-NOV-2013	---	19-NOV-2013	----	11-NOV-2013	19-NOV-2013	✓
<b>Clear Plastic Bottle - Natural (ED037-P)</b> MH_X_D18, MH_X_D15, RB_GW7_061113	MA_X_5/D11, MG_X_4/D10,	06-NOV-2013	---	20-NOV-2013	----	11-NOV-2013	20-NOV-2013	✓
<b>Clear Plastic Bottle - Natural (ED037-P)</b> MG_X_4/D9,	MG_X_4/D3	07-NOV-2013	---	21-NOV-2013	----	11-NOV-2013	21-NOV-2013	✓
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
<b>Clear Plastic Bottle - Natural (ED041G)</b> TE_MW15, RB_GW6_051113,	TE_MW16, D03_GW_051113	05-NOV-2013	---	03-DEC-2013	----	08-NOV-2013	03-DEC-2013	✓
<b>Clear Plastic Bottle - Natural (ED041G)</b> MH_X_D18, MH_X_D15, RB_GW7_061113	MA_X_5/D11, MG_X_4/D10,	06-NOV-2013	---	04-DEC-2013	----	08-NOV-2013	04-DEC-2013	✓
<b>Clear Plastic Bottle - Natural (ED041G)</b> MG_X_4/D9,	MG_X_4/D3	07-NOV-2013	---	05-DEC-2013	----	08-NOV-2013	05-DEC-2013	✓
<b>ED045G: Chloride Discrete analyser</b>								
<b>Clear Plastic Bottle - Natural (ED045G)</b> TE_MW15, RB_GW6_051113,	TE_MW16, D03_GW_051113	05-NOV-2013	---	03-DEC-2013	----	08-NOV-2013	03-DEC-2013	✓
<b>Clear Plastic Bottle - Natural (ED045G)</b> MH_X_D18, MH_X_D15, RB_GW7_061113	MA_X_5/D11, MG_X_4/D10,	06-NOV-2013	---	04-DEC-2013	----	08-NOV-2013	04-DEC-2013	✓
<b>Clear Plastic Bottle - Natural (ED045G)</b> MG_X_4/D9,	MG_X_4/D3	07-NOV-2013	---	05-DEC-2013	----	08-NOV-2013	05-DEC-2013	✓



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>ED093F: Dissolved Major Cations</b>								
Clear Plastic Bottle - Natural (ED093F) TE_MW15, RB_GW6_051113,	TE_MW16, D03_GW_051113	05-NOV-2013	---	12-NOV-2013	----	08-NOV-2013	12-NOV-2013	✓
Clear Plastic Bottle - Natural (ED093F) MH_X_D18, MH_X_D15, RB_GW7_061113	MA_X_5/D11, MG_X_4/D10,	06-NOV-2013	---	13-NOV-2013	----	08-NOV-2013	13-NOV-2013	✓
Clear Plastic Bottle - Natural (ED093F) MG_X_4/D9,	MG_X_4/D3	07-NOV-2013	---	14-NOV-2013	----	08-NOV-2013	14-NOV-2013	✓
<b>EG020F: Dissolved Metals by ICP-MS</b>								
Clear Plastic Bottle - Natural (EG020A-F) MG_X_4/D10,	RB_GW7_061113	06-NOV-2013	---	05-MAY-2014	----	13-NOV-2013	05-MAY-2014	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) TE_MW15, RB_GW6_051113,	TE_MW16, D03_GW_051113	05-NOV-2013	---	04-MAY-2014	----	13-NOV-2013	04-MAY-2014	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) MH_X_D18, MH_X_D15	MA_X_5/D11,	06-NOV-2013	---	05-MAY-2014	----	13-NOV-2013	05-MAY-2014	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) MG_X_4/D9,	MG_X_4/D3	07-NOV-2013	---	06-MAY-2014	----	13-NOV-2013	06-MAY-2014	✓
<b>EG035F: Dissolved Mercury by FIMS</b>								
Clear Plastic Bottle - Natural (EG035F) MG_X_4/D10,	RB_GW7_061113	06-NOV-2013	---	04-DEC-2013	----	14-NOV-2013	04-DEC-2013	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) TE_MW15, RB_GW6_051113,	TE_MW16, D03_GW_051113	05-NOV-2013	---	03-DEC-2013	----	14-NOV-2013	03-DEC-2013	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) MH_X_D18, MH_X_D15	MA_X_5/D11,	06-NOV-2013	---	04-DEC-2013	----	14-NOV-2013	04-DEC-2013	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) MG_X_4/D9,	MG_X_4/D3	07-NOV-2013	---	05-DEC-2013	----	14-NOV-2013	05-DEC-2013	✓
<b>EK040P: Fluoride by PC Titrator</b>								
Clear Plastic Bottle - Natural (EK040P) TE_MW15, RB_GW6_051113,	TE_MW16, D03_GW_051113	05-NOV-2013	---	03-DEC-2013	----	11-NOV-2013	03-DEC-2013	✓
Clear Plastic Bottle - Natural (EK040P) MH_X_D18, MH_X_D15, RB_GW7_061113	MA_X_5/D11, MG_X_4/D10,	06-NOV-2013	---	04-DEC-2013	----	11-NOV-2013	04-DEC-2013	✓
Clear Plastic Bottle - Natural (EK040P) MG_X_4/D9,	MG_X_4/D3	07-NOV-2013	---	05-DEC-2013	----	11-NOV-2013	05-DEC-2013	✓





Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Amber Glass Bottle - Unpreserved (EP066) TE_MW15, RB_GW6_051113,	TE_MW16, D03_GW_051113	05-NOV-2013	11-NOV-2013	12-NOV-2013	✓	12-NOV-2013	21-DEC-2013	✓
Amber Glass Bottle - Unpreserved (EP066) MA_X_5/D11		06-NOV-2013	11-NOV-2013	13-NOV-2013	✓	12-NOV-2013	21-DEC-2013	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
Amber Glass Bottle - Unpreserved (EP071) TE_MW15, RB_GW6_051113,	TE_MW16, D03_GW_051113	05-NOV-2013	11-NOV-2013	12-NOV-2013	✓	12-NOV-2013	21-DEC-2013	✓
Amber Glass Bottle - Unpreserved (EP071) MH_X_D18, MH_X_D15, RB_GW7_061113	MA_X_5/D11, MG_X_4/D10,	06-NOV-2013	11-NOV-2013	13-NOV-2013	✓	12-NOV-2013	21-DEC-2013	✓
Amber Glass Bottle - Unpreserved (EP071) MG_X_4/D9,	MG_X_4/D3	07-NOV-2013	11-NOV-2013	14-NOV-2013	✓	12-NOV-2013	21-DEC-2013	✓
<b>EP074D: Fumigants</b>								
Amber VOC Vial - Sulfuric Acid (EP074) TE_MW15, RB_GW6_051113,	TE_MW16, D03_GW_051113	05-NOV-2013	12-NOV-2013	19-NOV-2013	✓	12-NOV-2013	19-NOV-2013	✓
Amber VOC Vial - Sulfuric Acid (EP074) MA_X_5/D11		06-NOV-2013	12-NOV-2013	20-NOV-2013	✓	12-NOV-2013	20-NOV-2013	✓
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Amber VOC Vial - Sulfuric Acid (EP074) TE_MW15, RB_GW6_051113,	TE_MW16, D03_GW_051113	05-NOV-2013	12-NOV-2013	19-NOV-2013	✓	12-NOV-2013	19-NOV-2013	✓
Amber VOC Vial - Sulfuric Acid (EP074) MA_X_5/D11		06-NOV-2013	12-NOV-2013	20-NOV-2013	✓	12-NOV-2013	20-NOV-2013	✓
<b>EP074F: Halogenated Aromatic Compounds</b>								
Amber VOC Vial - Sulfuric Acid (EP074) TE_MW15, RB_GW6_051113,	TE_MW16, D03_GW_051113	05-NOV-2013	12-NOV-2013	19-NOV-2013	✓	12-NOV-2013	19-NOV-2013	✓
Amber VOC Vial - Sulfuric Acid (EP074) MA_X_5/D11		06-NOV-2013	12-NOV-2013	20-NOV-2013	✓	12-NOV-2013	20-NOV-2013	✓
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Amber VOC Vial - Sulfuric Acid (EP074) TE_MW15, RB_GW6_051113,	TE_MW16, D03_GW_051113	05-NOV-2013	12-NOV-2013	19-NOV-2013	✓	12-NOV-2013	19-NOV-2013	✓
Amber VOC Vial - Sulfuric Acid (EP074) MA_X_5/D11		06-NOV-2013	12-NOV-2013	20-NOV-2013	✓	12-NOV-2013	20-NOV-2013	✓



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP074H: Naphthalene</b>								
Amber VOC Vial - Sulfuric Acid (EP074) TE_MW15, RB_GW6_051113,	TE_MW16, D03_GW_051113	05-NOV-2013	12-NOV-2013	19-NOV-2013	✓	12-NOV-2013	19-NOV-2013	✓
Amber VOC Vial - Sulfuric Acid (EP074) MA_X_5/D11		06-NOV-2013	12-NOV-2013	20-NOV-2013	✓	12-NOV-2013	20-NOV-2013	✓
<b>EP074B: Oxygenated Compounds</b>								
Amber VOC Vial - Sulfuric Acid (EP074) TE_MW15, RB_GW6_051113,	TE_MW16, D03_GW_051113	05-NOV-2013	12-NOV-2013	19-NOV-2013	✓	12-NOV-2013	19-NOV-2013	✓
Amber VOC Vial - Sulfuric Acid (EP074) MA_X_5/D11		06-NOV-2013	12-NOV-2013	20-NOV-2013	✓	12-NOV-2013	20-NOV-2013	✓
<b>EP074C: Sulfonated Compounds</b>								
Amber VOC Vial - Sulfuric Acid (EP074) TE_MW15, RB_GW6_051113,	TE_MW16, D03_GW_051113	05-NOV-2013	12-NOV-2013	19-NOV-2013	✓	12-NOV-2013	19-NOV-2013	✓
Amber VOC Vial - Sulfuric Acid (EP074) MA_X_5/D11		06-NOV-2013	12-NOV-2013	20-NOV-2013	✓	12-NOV-2013	20-NOV-2013	✓
<b>EP074G: Trihalomethanes</b>								
Amber VOC Vial - Sulfuric Acid (EP074) TE_MW15, RB_GW6_051113,	TE_MW16, D03_GW_051113	05-NOV-2013	12-NOV-2013	19-NOV-2013	✓	12-NOV-2013	19-NOV-2013	✓
Amber VOC Vial - Sulfuric Acid (EP074) MA_X_5/D11		06-NOV-2013	12-NOV-2013	20-NOV-2013	✓	12-NOV-2013	20-NOV-2013	✓
<b>EP075(SIM)A: Phenolic Compounds</b>								
Amber Glass Bottle - Unpreserved (EP075(SIM)) TE_MW15, RB_GW6_051113,	TE_MW16, D03_GW_051113	05-NOV-2013	11-NOV-2013	12-NOV-2013	✓	12-NOV-2013	21-DEC-2013	✓
Amber Glass Bottle - Unpreserved (EP075(SIM)) MH_X_D18, MH_X_D15, RB_GW7_061113	MA_X_5/D11, MG_X_4/D10,	06-NOV-2013	11-NOV-2013	13-NOV-2013	✓	12-NOV-2013	21-DEC-2013	✓
Amber Glass Bottle - Unpreserved (EP075(SIM)) MG_X_4/D9,	MG_X_4/D3	07-NOV-2013	11-NOV-2013	14-NOV-2013	✓	12-NOV-2013	21-DEC-2013	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Amber Glass Bottle - Unpreserved (EP075(SIM)) TE_MW15, RB_GW6_051113,	TE_MW16, D03_GW_051113	05-NOV-2013	11-NOV-2013	12-NOV-2013	✓	12-NOV-2013	21-DEC-2013	✓
Amber Glass Bottle - Unpreserved (EP075(SIM)) MH_X_D18, MH_X_D15, RB_GW7_061113	MA_X_5/D11, MG_X_4/D10,	06-NOV-2013	11-NOV-2013	13-NOV-2013	✓	12-NOV-2013	21-DEC-2013	✓
Amber Glass Bottle - Unpreserved (EP075(SIM)) MG_X_4/D9,	MG_X_4/D3	07-NOV-2013	11-NOV-2013	14-NOV-2013	✓	12-NOV-2013	21-DEC-2013	✓



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP080: BTEXN</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> TE_MW15, RB_GW6_051113,	TE_MW16, D03_GW_051113	05-NOV-2013	12-NOV-2013	19-NOV-2013	✓	12-NOV-2013	19-NOV-2013	✓
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MH_X_D18, MH_X_D15, RB_GW7_061113	MA_X_5/D11, MG_X_4/D10,	06-NOV-2013	12-NOV-2013	20-NOV-2013	✓	12-NOV-2013	20-NOV-2013	✓
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MG_X_4/D9,	MG_X_4/D3	07-NOV-2013	12-NOV-2013	21-NOV-2013	✓	12-NOV-2013	21-NOV-2013	✓
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> TS, TS,	TB, TB	30-OCT-2013	12-NOV-2013	13-NOV-2013	✓	12-NOV-2013	13-NOV-2013	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> TE_MW15, RB_GW6_051113,	TE_MW16, D03_GW_051113	05-NOV-2013	12-NOV-2013	19-NOV-2013	✓	12-NOV-2013	19-NOV-2013	✓
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MH_X_D18, MH_X_D15, RB_GW7_061113	MA_X_5/D11, MG_X_4/D10,	06-NOV-2013	12-NOV-2013	20-NOV-2013	✓	12-NOV-2013	20-NOV-2013	✓
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MG_X_4/D9,	MG_X_4/D3	07-NOV-2013	12-NOV-2013	21-NOV-2013	✓	12-NOV-2013	21-NOV-2013	✓
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> TB,	TB	30-OCT-2013	12-NOV-2013	13-NOV-2013	✓	12-NOV-2013	13-NOV-2013	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Alkalinity by PC Titrator	ED037-P	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	2	17	11.8	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	17	11.8	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	4	38	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	2	14	14.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	6	16.7	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	11	18.2	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	15	13.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	4	37	10.8	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	11	18.2	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
Alkalinity by PC Titrator	ED037-P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	2	38	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	14	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	6	16.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	15	6.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	37	5.4	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
Chloride by Discrete Analyser	ED045G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	2	38	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	14	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	6	16.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	15	6.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	37	5.4	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



Matrix: **WATER** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Method Blanks (MB) - Continued</b>							
Volatile Organic Compounds	EP074	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
Chloride by Discrete Analyser	ED045G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	2	38	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	14	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	6	16.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	15	6.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	37	5.4	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Sulfate (Turbidimetric) as SO <sub>4</sub> <sup>2-</sup> by Discrete Analyser	ED041G	WATER	APHA 21st ed., 4500-SO <sub>4</sub> Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> <sup>2-</sup> concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Chloride by Discrete Analyser	ED045G	WATER	APHA 21st ed., 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	Major Cations is determined based on APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um filtered sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Hardness parameters are calculated based on APHA 21st ed., 2340 B. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): Samples are 0.45 um filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) Samples are 0.45 um filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Fluoride by PC Titrator	EK040P	WATER	APHA 21st ed., 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Ionic Balance by PCT DA and Turbi SO <sub>4</sub> DA	EN055 - PG	WATER	APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by Turbi SO <sub>4</sub> by DA. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)





Analytical Methods	Method	Matrix	Method Descriptions
Polychlorinated Biphenyls (PCB)	EP066	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
TPH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Volatile Organic Compounds	EP074	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
TPH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
Separatory Funnel Extraction of Liquids	ORG14	WATER	USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.



## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Matrix Spike (MS) Recoveries</b>							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	ES1324232-001	TE_MW15	Sulfate as SO4 - Turbidimetric	14808-79-8	Not Determined	----	<b>MS recovery not determined, background level greater than or equal to 4x spike level.</b>

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.

#### Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- No Analysis Holding Time Outliers exist.

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

<b>Work Order</b>	: <b>ES1324232</b>		
<b>Client</b>	: <b>ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact Address</b>	: MR JONATHAN LEKAWSKI GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Contact Address</b>	: Barbara Hanna 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: jonathan.lekawski@erm.com	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: WALLERAWANG MT PIPER GW	<b>Page</b>	: 1 of 3
<b>Order number</b>	: 0207423/0207420	<b>Quote number</b>	: ES2013ENVRES0370 (SY/278/13 V3)
<b>C-O-C number</b>	: ----	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b>	: ----		
<b>Sampler</b>	: D.BROOKES/S.HOLLOMAN		

#### Dates

Date Samples Received	: 08-NOV-2013	Issue Date	: 08-NOV-2013 18:32
Client Requested Due Date	: 18-NOV-2013	Scheduled Reporting Date	: <b>18-NOV-2013</b>

#### Delivery Details

Mode of Delivery	: Carrier	Temperature	: 16.8°C - Ice bricks present
No. of coolers/boxes	: 2 HARD	No. of samples received	: 15
Security Seal	: Intact.	No. of samples analysed	: 15

#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Sample containers do not comply to pretreatment / preservation standards (AS, APHA, USEPA). Please refer to the Sample Container(s)/Preservation Non-Compliance Log at the end of this report for details.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



### Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

Method Client sample ID	Sample Container Received	Preferred Sample Container for Analysis
<b>EG020A-F : Dissolved Metals by ICP-MS - Suite A</b>		
MG_X_4/D10	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - Nitric Acid; Filtered
RB_GW7_061113	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - Nitric Acid; Filtered
<b>EG035F : Dissolved Mercury by FIMS</b>		
MG_X_4/D10	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - Nitric Acid; Filtered
RB_GW7_061113	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - Nitric Acid; Filtered

### Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EG020F Dissolved Metals by ICPMS	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP066-PCB-WA Polychlorinated Biphenyls (PCB)	WATER - EP074 (water) Volatile Organic Compounds	WATER - EP080 BTEXN	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02A Major Anions (Chloride, Sulphate, Fluoride,	WATER - W-05 TRH/BTEXN/8 Metals
ES1324232-001	05-NOV-2013 15:00	TE_MW15	✓	✓	✓	✓		✓	✓	✓
ES1324232-002	05-NOV-2013 15:00	TE_MW16	✓	✓	✓	✓		✓	✓	✓
ES1324232-003	05-NOV-2013 15:00	RB_GW6_051113	✓	✓	✓	✓		✓	✓	✓
ES1324232-004	06-NOV-2013 15:00	MH_X_D18	✓	✓				✓	✓	✓
ES1324232-005	06-NOV-2013 15:00	MA_X_5/D11	✓	✓	✓	✓		✓	✓	✓
ES1324232-006	06-NOV-2013 15:00	MH_X_D15	✓	✓				✓	✓	✓
ES1324232-007	30-OCT-2013 15:00	TS					✓			
ES1324232-009	05-NOV-2013 15:00	D03_GW_051113	✓	✓	✓	✓		✓	✓	✓
ES1324232-010	06-NOV-2013 15:00	MG_X_4/D10	✓	✓				✓	✓	✓
ES1324232-011	07-NOV-2013 15:00	MG_X_4/D9	✓	✓				✓	✓	✓
ES1324232-012	07-NOV-2013 15:00	MG_X_4/D3	✓	✓				✓	✓	✓
ES1324232-013	30-OCT-2013 15:00	TS					✓			
ES1324232-015	06-NOV-2013 15:00	RB_GW7_061113	✓	✓				✓	✓	✓

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - W-14A PAH/Phenols (SIM)	WATER - W-18 TRH(C6 - C9)/BTEXN
ES1324232-001	05-NOV-2013 15:00	TE_MW15	✓	
ES1324232-002	05-NOV-2013 15:00	TE_MW16	✓	
ES1324232-003	05-NOV-2013 15:00	RB_GW6_051113	✓	
ES1324232-004	06-NOV-2013 15:00	MH_X_D18	✓	
ES1324232-005	06-NOV-2013 15:00	MA_X_5/D11	✓	
ES1324232-006	06-NOV-2013 15:00	MH_X_D15	✓	



			WATER - W-14A PAH/Phenols (SIM)	WATER - W-18 TRH(C6 - C9)/BTEXN
ES1324232-008	30-OCT-2013 15:00	TB		✓
ES1324232-009	05-NOV-2013 15:00	D03_GW_051113	✓	
ES1324232-010	06-NOV-2013 15:00	MG_X_4/D10	✓	
ES1324232-011	07-NOV-2013 15:00	MG_X_4/D9	✓	
ES1324232-012	07-NOV-2013 15:00	MG_X_4/D3	✓	
ES1324232-014	30-OCT-2013 15:00	TB		✓
ES1324232-015	06-NOV-2013 15:00	RB_GW7_061113	✓	

### Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

### Requested Deliverables

#### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

#### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com

#### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com

#### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

**CHAIN OF CUSTODY**  
ALS Laboratory:  
please tick ->

DADELAND 21 Burns Road, Rosedale SA 5095  
Ph: 08 839 0898 E: dadeland@alsglobal.com  
DARIBANE 32 Chand Street, Sturtford QLD 4053  
Ph: 07 3243 7222 E: sampas.braban@alsglobal.com  
DIALSTONE 46 Colerain Road, Drive Clinton QLD 4690  
Ph: 07 7471 5800 E: dstone@alsglobal.com

DMADAW 78 Harbour Road, Mackay QLD 4740  
Ph: 07 4944 0177 E: macaw@alsglobal.com  
DMELBOURNE 2-4 Wharf Road, Springvale VIC 3171  
Ph: 03 9548 8900 E: sampas.melbourne@alsglobal.com  
DMADGET 27 Sydney Road, Mulgoa NSW 2803  
Ph: 02 6972 8795 E: mulgoa.mel@alsglobal.com

DNEVCASTLE 5 Rose Gull Road, Warbrook NSW 2304  
Ph: 02 4868 5433 E: sampas.newcastle@alsglobal.com  
DNOVISA 419 Green Peace North, Nowra NSW 2541  
Ph: 024423 2003 E: nowra@alsglobal.com  
DPERTH 10 Hood Way, Albany WA 6550  
Ph: 08 92269 7656 E: sampas.perth@alsglobal.com

DSYDNEY 277-289 Woodpark Road, Smithfield NSW 2104  
Ph: 02 8764 8555 E: sampas.sydney@alsglobal.com  
DLOWNSVILLE 14-15 Dunsmuir Court, Berke QLD 4018  
Ph: 07 4789 0800 E: townsville.environment@alsglobal.com  
DMOLONGONG 50 Kenny Street, Wodonga NSW 2590  
Ph: 03 4624 3125 E: molongong@alsglobal.com

**TURNAROUND REQUIREMENTS:**  
 Standard TAT (List due date):  
 Non Standard or urgent TAT (List due date):

OFFICE: GROUND FLOOR, 33 SAUNDERS ST, PYRMONT NSW 2009  
PROJECT: Wallerawang Mt Piper GW  
ORDER NUMBER: 02074230207420  
PROJECT MANAGER: Jonathan Lukawski  
CONTACT PH: *Mt Piper*

ALS QUOTE NO: SY21813  
SAMPLER MOBILE: 0400918365  
SAMPLER: Dane Brookes/Skya Holman  
COC emailed to ALS? (YES / NO) *YES*  
Email Reports to (will default to you if no other addresses are listed):  
Symphony: DebraWest@erm.com  
PDFCS/VESDAT: EDD FORMAT (or default): PDFCS/VESDAT

RELINQUISHED BY: *[Signature]*  
DATE/TIME: *7/11/13 11:45am*  
RECEIVED BY: *[Signature]*  
DATE/TIME: *8/11 0830*

FOR LABORATORY USE ONLY  
Category/Serial Line  
File No./Matrix  
Random Sample  
Other Comments

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

Standard TAT (List due date):  
Non Standard or urgent TAT (List due date):

RELINQUISHED BY: *[Signature]*  
DATE/TIME: *7/11/13 11:45am*

RECEIVED BY: *[Signature]*  
DATE/TIME: *8/11 0830*

FOR LABORATORY USE ONLY

Environmental Division  
Sydney  
Work Order  
**ES1324232**

Telephone : + 61-2-8784 8555

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) / WATER (W)	CONTAINER INFORMATION	ANALYSIS REQUIRED INCLUDING SUITES (NB, Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).										Additional Information		
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below	refer to	TOTAL CONTAINERS	W-4 (TPH/TRH (C6-C36or 40)/BTEXN	W2 - Dissolved Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg) - W-2	EG020F - Additional Metals - Se, B, Fe, Mn	UTO-5W Phenols and PAH - <del>W-1</del>	VOC Scan	Cations - NT-1	Anions (Incl F) - NT-2A	PCB	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	TE-MW15	5/11/13	W	VS, P, AG, N, H		6	X	X	X	X	X	X	X	X	
2	TE-MW16	5/11/13	W	VS, P, AG, N, H		6	X	X	X	X	X	X	X	X	
3	RA-GW16-051113	5/11/13	W			6	X	X	X	X	X	X	X	X	
4	MH-X-D18	6/11/13	W			6	X	X	X	X	X	X	X	X	
5	MA-X-5/D11	6/11/13	W			6	X	X	X	X	X	X	X	X	
6	MH-X-D15	6/11/13	W			6	X	X	X	X	X	X	X	X	
7	TS	30/10/13	W	VS		2	X	X	X	X	X	X	X	X	
8	TB	30/10/13	W	VS		2	X	X	X	X	X	X	X	X	
9	D03-GW-051113	5/11/13	W	VS, P, AG, N, H		8	X	X	X	X	X	X	X	X	
<b>TOTAL</b>															

*Note this sample may contain NH4+*

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airtight Unpreserved Plastic  
V = VOA Via HCl Preserved; VB = VOA Via Sodium Bisulfate Preserved; VS = VOA Via Sulfuric Preserved; AV = Airtight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;  
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Solids; a = Unpreserved Bag



DLADEL05 21 Burma Road, Roerick SA 5095  
Ph: 08 8599 0860 E: roerick@alsglobal.com  
DERISBANE 32 Strand Street, Stafford QLD 4053  
Ph: 07 3243 7222 E: samples.stafford@alsglobal.com  
DGLADSD1ONE 46 Callender Drive, Clifton QLD 4680  
Ph: 07 7471 5500 E: gladstone@alsglobal.com

DUMACKY 78 Harbour Road, Mascay QLD 4740  
Ph: 07 4644 0177 E: mascay@alsglobal.com  
DWEILBOURNE 2-4 Weiland Road, Springvale VIC 3171  
Ph: 03 8545 8000 E: samples.melbourne@alsglobal.com  
DUMUDGE 27 Sydney Road, Mudgee NSW 2850  
Ph: 02 6372 9755 E: mudgee\_m@alsglobal.com

DNEWCASTLE 6 Rose Gum Road, Watermark NSW 2304  
Ph: 02 4585 5933 E: samples.newcastle@alsglobal.com  
DNDWRA 4/13 Geary Place North, Nowra NSW 2541  
Ph: 02 4423 2063 E: nowra@alsglobal.com  
DDEPRT 10 Hed Way, Miraga WA 6096  
Ph: 08 0209 7555 E: samples.perth@alsglobal.com

DSYDNEY 277-289 Woodpark Road, Smithfield NSW 2164  
Ph: 02 8794 8555 E: samples.sydny@alsglobal.com  
DTCOWNSVILLE 14-15 Derrin Court, Goble QLD 4015  
Ph: 07 4700 0000 E: townsville.environment@alsglobal.com  
DWOODLINGTONS 59 Kennedy Street, Woodroffe NSW 2560  
Ph: 02 4229 3125 E: portland@alsglobal.com

CLIENT: ERM  
OFFICE: GROUND FLOOR, 33 SAUNDERS ST, PYRMONT NSW 2009  
PROJECT: Wallerawang/HT Piper GW  
ORDER NUMBER: 02074230207420  
PROJECT MANAGER: Jonathan Lekawski  
CONTACT PH: [blank]SAMPLER: Dane Brookes/Syke Holicom  
SAMPLER MOBILE: 0400918365  
COC emailed to ALS? (YES / NO) EDD FORNAT (or default): PFC/GV/SS/DAT  
Email Reports to (will default to PML) or other addresses are listed: Symphony.Deliveries@erm.com

TURNAROUND REQUIREMENTS:  
Standard TAT may be longer for some tests e.g. Ultra Trace Organics  
 Non Standard or urgent TAT (List due date):  
 Standard TAT (List due date):

COC SEQUENCE NUMBER (circle)  
COC: 1 2 3 4 5 6 7  
OF: 1 2 3 4 5 6 7  
RECEIVED BY: [Signature]  
DATE/TIME: 7/11/13 11:45am

RELINQUISHED BY: [Signature]  
DATE/TIME: 8/11  
RECEIVED BY:  
DATE/TIME:

ALS USE	SAMPLE DETAILS (MATRIX, SOLID (S), WATER (W))	CONTAINER INFORMATION	ANALYSIS REQUIRED INCLUDING SUITES (NB, Suite Codes must be listed to attract suite price). Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).	FOR LABORATORY USE ONLY (Circle)	Additional Information											
	LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (codes below)	(refer to)	TOTAL CONTAINERS	W-4 (TPH/TRH (C6-C36or 40)/BTEXN	W2 - Dissolved Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg) - W-2	EG020F - Additional Metals - Se, B, Fe, Mn	UTO-5W Phenols and PAH - Ultra Trace	VOC Scan	Cations - NT-1	Anions (incl F) - NT-2A	PCB	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
	16	MG-X-4/D10	6/11/13	W	VS, P, N, H, AG		6	X	X	X	X	X	X	X		
	11	MG-X-4/D9	7/11/13	W	VS		6	X	X	X	X	X	X	X		
	12	MG-X-4/D3	7/11/13	W	VS		6	X	X	X	X	X	X	X		
	13	TS	30/10/13	W	VS		2	X	X	X	X	X	X	X		
	14	TB	30/10/13	W	VS		2	X	X	X	X	X	X	X		
	15	RB-QW7-06/113	6/11/13	W	VS, P, N, H, AG		6	X	X	X	X	X	X	X		
<b>TOTAL</b>																

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airflight Unpreserved Plastic  
V = VOA Via HCl Preserved; VB = VOA Via Sodium Bisulphate Preserved; VS = VOA Via Sulfuric Preserved; AV = Airflight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass  
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Salts; B = Unpreserved Bag

## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>ES1324556</b> <b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : MR JONATHAN LEKAWSKI <b>Address</b> : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007  <b>E-mail</b> : jonathan.lekawski@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800 <b>Project</b> : WALLERAWANG MT PIPER GW <b>Order number</b> : 0207423/0207420 <b>C-O-C number</b> : ---- <b>Sampler</b> : DB/SH <b>Site</b> : ----  <b>Quote number</b> : SY/278/13 V3	<b>Page</b> : 1 of 11  <b>Laboratory</b> : Environmental Division Sydney <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164  <b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555 <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement  <b>Date Samples Received</b> : 12-NOV-2013 <b>Issue Date</b> : 20-NOV-2013  <b>No. of samples received</b> : 8 <b>No. of samples analysed</b> : 8
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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

### *Signatories*

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ashesh Patel	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics



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## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EP080: Sample TRIP SPIKE contains volatile compounds spiked into the sample containers prior to dispatch from the laboratory. BTEX compounds spiked at 20 ug/L.**



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MH_X_D17	MH_X_D19	MG_X_4/D4	D04_GW_081113	RB_GW7_061113
				08-NOV-2013 15:00	08-NOV-2013 15:00	08-NOV-2013 15:00	08-NOV-2013 15:00	05-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324556-001	ES1324556-002	ES1324556-003	ES1324556-004	ES1324556-005
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	123	----	<1	119	<1
Total Alkalinity as CaCO3	----	1	mg/L	123	----	<1	119	<1
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	610	----	865	608	<1
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	38	----	3	37	<1
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	157	----	16	162	<1
Magnesium	7439-95-4	1	mg/L	79	----	9	79	<1
Sodium	7440-23-5	1	mg/L	47	----	25	47	<1
Potassium	7440-09-7	1	mg/L	15	----	8	15	<1
<b>EG020F: Dissolved Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	0.008	<0.001	0.129	0.008	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.0004	0.0020	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.010	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.025	<0.001	<0.001
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.047	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	0.936	14.6	1.18	1.08	<0.001
Nickel	7440-02-0	0.001	mg/L	0.014	0.762	0.052	0.016	<0.001
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L	0.051	0.355	0.592	0.040	<0.005
Boron	7440-42-8	0.05	mg/L	<0.05	2.17	<0.05	<0.05	<0.05
Iron	7439-89-6	0.05	mg/L	9.12	18.8	275	9.96	<0.05
<b>EG035F: Dissolved Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
<b>EK040P: Fluoride by PC Titrator</b>								
Fluoride	16984-48-8	0.1	mg/L	0.4	----	<0.1	0.4	<0.1
<b>EN055: Ionic Balance</b>								
Total Anions	----	0.01	meq/L	16.2	----	18.1	16.1	<0.01
Total Cations	----	0.01	meq/L	16.8	----	----	17.0	<0.01
Total Cations	----	0.01	meq/L	----	----	17.6	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MH_X_D17	MH_X_D19	MG_X_4/D4	D04_GW_081113	RB_GW7_061113
				08-NOV-2013 15:00	08-NOV-2013 15:00	08-NOV-2013 15:00	08-NOV-2013 15:00	05-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324556-001	ES1324556-002	ES1324556-003	ES1324556-004	ES1324556-005
<b>EN055: Ionic Balance - Continued</b>								
Ionic Balance	----	0.01	%	1.64	----	----	2.84	----
Ionic Balance	----	0.01	%	----	----	1.37	----	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.6
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MH_X_D17	MH_X_D19	MG_X_4/D4	D04_GW_081113	RB_GW7_061113
				08-NOV-2013 15:00	08-NOV-2013 15:00	08-NOV-2013 15:00	08-NOV-2013 15:00	05-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324556-001	ES1324556-002	ES1324556-003	ES1324556-004	ES1324556-005
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	26.7	30.5	30.1	30.9	41.4
2-Chlorophenol-D4	93951-73-6	0.1	%	52.7	60.7	63.3	56.5	67.0
2,4,6-Tribromophenol	118-79-6	0.1	%	59.7	66.3	67.1	62.6	64.1
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	54.2	63.0	67.6	58.8	60.8
Anthracene-d10	1719-06-8	0.1	%	54.9	64.8	66.9	62.1	98.0
4-Terphenyl-d14	1718-51-0	0.1	%	74.2	72.2	68.5	65.1	95.3





## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sample ID	MH_X_D17	MH_X_D19	MG_X_4/D4	D04_GW_081113	RB_GW7_061113
Client sampling date / time	08-NOV-2013 15:00	08-NOV-2013 15:00	08-NOV-2013 15:00	08-NOV-2013 15:00	05-NOV-2013 15:00
	ES1324556-001	ES1324556-002	ES1324556-003	ES1324556-004	ES1324556-005

Compound	CAS Number	LOR	Unit	ES1324556-001	ES1324556-002	ES1324556-003	ES1324556-004	ES1324556-005
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	87.8	84.6	92.2	90.0	131
Toluene-D8	2037-26-5	0.1	%	93.9	108	108	101	121
4-Bromofluorobenzene	460-00-4	0.1	%	98.1	98.5	105	97.6	113



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

<b>RB_GW9_081113</b>	<b>TS</b>	<b>TB</b>	---	---
08-NOV-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	---	---

Client sampling date / time

<b>ES1324556-006</b>	<b>ES1324556-007</b>	<b>ES1324556-008</b>	---	---
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Compound	CAS Number	LOR	Unit	ES1324556-006	ES1324556-007	ES1324556-008	---	---
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	---	---	---	---
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	---	---	---	---
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	---	---	---	---
Total Alkalinity as CaCO3	---	1	mg/L	<1	---	---	---	---
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	---	---	---	---
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	<1	---	---	---	---
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	<1	---	---	---	---
Magnesium	7439-95-4	1	mg/L	<1	---	---	---	---
Sodium	7440-23-5	1	mg/L	<1	---	---	---	---
Potassium	7440-09-7	1	mg/L	<1	---	---	---	---
<b>EG020F: Dissolved Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	<0.001	---	---	---	---
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	---	---	---	---
Chromium	7440-47-3	0.001	mg/L	<0.001	---	---	---	---
Copper	7440-50-8	0.001	mg/L	<0.001	---	---	---	---
Lead	7439-92-1	0.001	mg/L	<0.001	---	---	---	---
Manganese	7439-96-5	0.001	mg/L	<0.001	---	---	---	---
Nickel	7440-02-0	0.001	mg/L	<0.001	---	---	---	---
Selenium	7782-49-2	0.01	mg/L	<0.01	---	---	---	---
Zinc	7440-66-6	0.005	mg/L	<0.005	---	---	---	---
Boron	7440-42-8	0.05	mg/L	<0.05	---	---	---	---
Iron	7439-89-6	0.05	mg/L	<0.05	---	---	---	---
<b>EG035F: Dissolved Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	---	---	---	---
<b>EK040P: Fluoride by PC Titrator</b>								
Fluoride	16984-48-8	0.1	mg/L	<0.1	---	---	---	---
<b>EN055: Ionic Balance</b>								
Total Anions	---	0.01	meq/L	<0.01	---	---	---	---
Total Cations	---	0.01	meq/L	<0.01	---	---	---	---
<b>EP075(SIM)A: Phenolic Compounds</b>								



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sample ID	RB_GW9_081113	TS	TB	---	---
Client sampling date / time	08-NOV-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	---	---
	ES1324556-006	ES1324556-007	ES1324556-008	----	----

Compound	CAS Number	LOR	Unit	ES1324556-006	ES1324556-007	ES1324556-008	----	----
<b>EP075(SIM)A: Phenolic Compounds - Continued</b>								
Phenol	108-95-2	1.0	µg/L	<1.0	----	----	----	----
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	----	----	----	----
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	----	----	----	----
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	----	----	----	----
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	----	----	----	----
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	----	----	----	----
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	----	----	----	----
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	----	----	----	----
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	----	----	----	----
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	----	----	----	----
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	----	----	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	1.0	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	----	----	----	----
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	----	----	----	----
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	----	----	----	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	20	µg/L	<20	----	<20	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				RB_GW9_081113	TS	TB	---	---
				08-NOV-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	---	---
Compound	CAS Number	LOR	Unit	ES1324556-006	ES1324556-007	ES1324556-008	---	---
<b>EP080/071: Total Petroleum Hydrocarbons - Continued</b>								
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	<20	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	----	<20	----	----
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	----	----	----	----
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	<1	15	<1	----	----
Toluene	108-88-3	2	µg/L	<2	16	<2	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	15	<2	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	16	<2	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	17	<2	----	----
^ Total Xylenes	1330-20-7	2	µg/L	<2	33	<2	----	----
^ Sum of BTEX	----	1	µg/L	<1	79	<1	----	----
Naphthalene	91-20-3	5	µg/L	<5	18	<5	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	31.7	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	65.2	----	----	----	----
2,4,6-Tribromophenol	118-79-6	0.1	%	75.0	----	----	----	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	69.9	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%	68.7	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	65.6	----	----	----	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	99.8	128	112	----	----
Toluene-D8	2037-26-5	0.1	%	99.5	97.7	93.2	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	97.7	107	109	----	----



**Analytical Results**

Sub-Matrix: **WATER** (Matrix: **WATER**)

Client sample ID

<b>RB_GW9_081113</b>	<b>TS</b>	<b>TB</b>	----	----
08-NOV-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	----	----
<b>ES1324556-006</b>	<b>ES1324556-007</b>	<b>ES1324556-008</b>	----	----

Client sampling date / time

Compound CAS Number LOR Unit

**EP080S: TPH(V)/BTEX Surrogates - Continued**



## Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP075(SIM): Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	10.0	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
<b>EP075(SIM): PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27.4	113
4-Terphenyl-d14	1718-51-0	32	112
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128



## QUALITY CONTROL REPORT

<b>Work Order</b>	: <b>ES1324556</b>	Page	: 1 of 14
<b>Client</b>	: <b>ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: MR JONATHAN LEKAWSKI	<b>Contact</b>	: Barbara Hanna
<b>Address</b>	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
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<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: WALLERAWANG MT PIPER GW	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b>	: ----	<b>Date Samples Received</b>	: 12-NOV-2013
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: 20-NOV-2013
<b>Sampler</b>	: DB/SH	<b>No. of samples received</b>	: 8
<b>Order number</b>	: 0207423/0207420	<b>No. of samples analysed</b>	: 8
<b>Quote number</b>	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ashesh Patel	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics



### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :            Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
                  CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
                  LOR = Limit of reporting  
                  RPD = Relative Percentage Difference  
                  # = Indicates failed QC



## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>ED037P: Alkalinity by PC Titrator (QC Lot: 3164326)</b>									
ES1324554-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	111	111	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	111	111	0.0	0% - 20%
ES1324610-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	12	12	0.0	0% - 50%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	12	12	0.0	0% - 50%
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3158893)</b>									
ES1324238-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	308	305	1.0	0% - 20%
ES1324622-007	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	968	984	1.6	0% - 20%
<b>ED045G: Chloride Discrete analyser (QC Lot: 3158892)</b>									
ES1324238-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	2980	2990	0.4	0% - 20%
ES1324622-007	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	8690	8670	0.2	0% - 20%
<b>ED093F: Dissolved Major Cations (QC Lot: 3158891)</b>									
ES1324238-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	52	51	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	149	145	2.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1620	1600	1.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	74	72	2.2	0% - 20%
ES1324627-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	17	17	0.0	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	10	10	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	281	282	0.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	118	121	2.1	0% - 20%
<b>EG020F: Dissolved Metals by ICP-MS (QC Lot: 3157725)</b>									
ES1324555-002	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	3.23	3.36	3.9	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.019	0.018	6.2	0% - 50%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.010	0.010	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.33	0.35	5.1	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG020F: Dissolved Metals by ICP-MS (QC Lot: 3157725) - continued</b>									
ES1324571-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.002	0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.170	0.170	0.0	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.010	0.010	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	0.15	0.15	0.0	No Limit
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.06	0.0	No Limit		
<b>EG035F: Dissolved Mercury by FIMS (QC Lot: 3157724)</b>									
ES1324551-005	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1324573-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
<b>EK040P: Fluoride by PC Titrator (QC Lot: 3164327)</b>									
ES1324554-001	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	1.2	1.1	0.0	0% - 50%
ES1324610-001	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.2	0.2	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3157454)</b>									
ES1324555-005	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3159665)</b>									
ES1324631-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1324787-002	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3159667)</b>									
ES1324554-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1324693-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3157454)</b>									
ES1324555-005	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3159665)</b>									
ES1324631-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES1324787-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3159667)</b>									
ES1324554-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES1324693-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3157454)</b>									
ES1324555-005	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
<b>EP080: BTEXN (QC Lot: 3157454) - continued</b>										
ES1324555-005	Anonymous	EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit	
<b>EP080: BTEXN (QC Lot: 3159665)</b>										
ES1324631-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit	
			106-42-3							
			EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
ES1324787-002	Anonymous	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit	
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit	
			106-42-3							
ES1324554-001	Anonymous	EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit	
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit	
ES1324693-001	Anonymous		106-42-3							
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit	
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit	



### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>ED037P: Alkalinity by PC Titrator (QCLot: 3164326)</b>									
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	----	200 mg/L	90.1	81	111	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3158893)</b>									
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	95.4	86	122	
<b>ED045G: Chloride Discrete analyser (QCLot: 3158892)</b>									
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	94.1	77	123	
<b>ED093F: Dissolved Major Cations (QCLot: 3158891)</b>									
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100	87	113	
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	89	113	
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	97.9	79	113	
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	99.7	87	115	
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3157725)</b>									
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	96.4	80	118	
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	95.2	82	112	
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	90.0	81	111	
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	95.9	80	112	
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	96.7	83	111	
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	95.4	81	113	
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	93.6	81	113	
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	91.3	73	125	
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	97.5	80	116	
EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.1 mg/L	99.3	69	123	
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	93.0	77	115	
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3157724)</b>									
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	106	78	114	
<b>EK040P: Fluoride by PC Titrator (QCLot: 3164327)</b>									
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5.0 mg/L	90.2	75	119	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3157986)</b>									
EP075(SIM): Phenol	108-95-2	0.2	µg/L	----	5 µg/L	44.0	24.5	61.9	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Chlorophenol	95-57-8	0.2	µg/L	----	5 µg/L	77.6	63.8	110	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Methylphenol	95-48-7	0.2	µg/L	----	5 µg/L	74.1	55.9	112	
		1	µg/L	<1.0	----	----	----	----	





Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3157986) - continued</b>									
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	0.4	µg/L	----	10 µg/L	70.2	42.5	114	
		2	µg/L	<2.0	----	----	----	----	
EP075(SIM): 2-Nitrophenol	88-75-5	0.2	µg/L	----	5 µg/L	68.0	62.7	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.2	µg/L	----	5 µg/L	77.4	59.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.2	µg/L	----	5 µg/L	77.0	59.3	122	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.2	µg/L	----	5 µg/L	78.7	64.3	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.2	µg/L	----	5 µg/L	72.2	63	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.2	µg/L	----	5 µg/L	81.8	58.7	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.2	µg/L	----	5 µg/L	79.4	50	108	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Pentachlorophenol	87-86-5	0.4	µg/L	----	10 µg/L	80.6	8.7	95	
		2	µg/L	<2.0	----	----	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3158326)</b>									
EP075(SIM): Phenol	108-95-2	0.2	µg/L	----	5 µg/L	47.6	24.5	61.9	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Chlorophenol	95-57-8	0.2	µg/L	----	5 µg/L	84.4	63.8	110	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Methylphenol	95-48-7	0.2	µg/L	----	5 µg/L	87.9	55.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	0.4	µg/L	----	10 µg/L	80.2	42.5	114	
		2	µg/L	<2.0	----	----	----	----	
EP075(SIM): 2-Nitrophenol	88-75-5	0.2	µg/L	----	5 µg/L	87.9	62.7	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.2	µg/L	----	5 µg/L	91.2	59.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.2	µg/L	----	5 µg/L	86.2	59.3	122	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.2	µg/L	----	5 µg/L	93.7	64.3	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.2	µg/L	----	5 µg/L	78.7	63	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.2	µg/L	----	5 µg/L	86.6	58.7	118	
		1	µg/L	<1.0	----	----	----	----	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3158326) - continued</b>									
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.2	µg/L	----	5 µg/L	93.5	50	108	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Pentachlorophenol	87-86-5	0.4	µg/L	----	10 µg/L	90.0	8.7	95	
		2	µg/L	<2.0	----	----	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3157986)</b>									
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	5 µg/L	72.5	58.6	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	5 µg/L	80.5	63.6	114	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	5 µg/L	78.2	62.2	113	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	5 µg/L	81.2	63.9	115	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	5 µg/L	81.4	62.6	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	5 µg/L	84.8	64.3	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	5 µg/L	86.5	63.6	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	5 µg/L	77.2	63.1	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	5 µg/L	83.1	64.1	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	5 µg/L	79.9	62.5	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	5 µg/L	74.7	61.7	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	5 µg/L	76.2	61.7	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	5 µg/L	74.5	63.3	117	
		0.5	µg/L	<0.5	----	----	----	----	
EP075(SIM): Indeno(1,2,3-cd)pyrene	193-39-5	0.2	µg/L	----	5 µg/L	68.9	59.9	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	----	5 µg/L	70.4	61.2	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	----	5 µg/L	73.3	59.1	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	1	µg/L	<1.0	----	----	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3158326)</b>									



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3158326) - continued</b>									
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	5 µg/L	68.0	58.6	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	5 µg/L	83.8	63.6	114	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	5 µg/L	82.8	62.2	113	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	5 µg/L	92.0	63.9	115	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	5 µg/L	102	62.6	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	5 µg/L	108	64.3	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	5 µg/L	99.0	63.6	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	5 µg/L	106	63.1	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	5 µg/L	92.8	64.1	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	5 µg/L	94.1	62.5	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	5 µg/L	71.0	61.7	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	5 µg/L	66.6	61.7	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	5 µg/L	106	63.3	117	
		0.5	µg/L	<0.5	----	----	----	----	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	5 µg/L	93.3	59.9	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	----	5 µg/L	91.2	61.2	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	----	5 µg/L	91.0	59.1	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	1	µg/L	<1.0	----	----	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3157454)</b>									
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	96.2	75	127	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3157985)</b>									
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	103	59	129	
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	102	71	131	
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	96.4	62	120	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3158325)</b>									



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3158325) - continued</b>									
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	97.2	59	129	
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	99.7	71	131	
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	93.2	62	120	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3159665)</b>									
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	103	75	127	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3159667)</b>									
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	97.8	75	127	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3157454)</b>									
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	98.3	75	127	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3157985)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	2500 µg/L	97.0	58.9	131	
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	99.7	73.9	138	
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----	
		50	µg/L	----	1500 µg/L	101	67	127	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3158325)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	2500 µg/L	96.3	58.9	131	
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	102	73.9	138	
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----	
		50	µg/L	----	1500 µg/L	105	67	127	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3159665)</b>									
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	104	75	127	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3159667)</b>									
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	96.7	75	127	
<b>EP080: BTEXN (QCLot: 3157454)</b>									
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	84.2	70	124	
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	97.8	65	129	
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	94.4	70	120	
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	94.3	69	121	
	106-42-3								
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	100	72	122	
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	96.4	70	124	
<b>EP080: BTEXN (QCLot: 3159665)</b>									
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	111	70	124	
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	112	65	129	
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	106	70	120	
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	103	69	121	
	106-42-3								
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	111	72	122	



Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit		Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High
<b>EP080: BTEXN (QCLot: 3159665) - continued</b>								
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	119	70	124
<b>EP080: BTEXN (QCLot: 3159667)</b>								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	87.7	70	124
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	77.3	65	129
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	82.5	70	120
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	74.8	69	121
	106-42-3							
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	86.0	72	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	91.6	70	124

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: WATER				Matrix Spike (MS) Report			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%) Low High	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3158893)</b>							
ES1324238-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130
<b>ED045G: Chloride Discrete analyser (QCLot: 3158892)</b>							
ES1324238-001	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	# Not Determined	70	130
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3157725)</b>							
ES1324555-003	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	123	70	130
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	120	70	130
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	119	70	130
		EG020A-F: Copper	7440-50-8	0.2 mg/L	117	70	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	109	70	130
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	# Not Determined	70	130
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	122	70	130
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	128	70	130
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3157724)</b>							
ES1324555-001	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	80.2	70	130
<b>EK040P: Fluoride by PC Titrator (QCLot: 3164327)</b>							
ES1324554-001	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	102	70	130



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report				
				Spike	SpikeRecovery(%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3157454)</b>								
ES1324555-005	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	113	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3159665)</b>								
ES1324631-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	125	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3159667)</b>								
ES1324554-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	123	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3157454)</b>								
ES1324555-005	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	115	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3159665)</b>								
ES1324631-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	122	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3159667)</b>								
ES1324554-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	121	70	130	
<b>EP080: BTEXN (QCLot: 3157454)</b>								
ES1324555-005	Anonymous	EP080: Benzene	71-43-2	25 µg/L	90.0	70	130	
		EP080: Toluene	108-88-3	25 µg/L	103	70	130	
		EP080: Ethylbenzene	100-41-4	25 µg/L	99.4	70	130	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	100	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	25 µg/L	106	70	130	
		EP080: Naphthalene	91-20-3	25 µg/L	103	70	130	
<b>EP080: BTEXN (QCLot: 3159665)</b>								
ES1324631-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	117	70	130	
		EP080: Toluene	108-88-3	25 µg/L	110	70	130	
		EP080: Ethylbenzene	100-41-4	25 µg/L	113	70	130	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	112	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	25 µg/L	114	70	130	
		EP080: Naphthalene	91-20-3	25 µg/L	118	70	130	
<b>EP080: BTEXN (QCLot: 3159667)</b>								
ES1324554-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	97.5	70	130	
		EP080: Toluene	108-88-3	25 µg/L	104	70	130	
		EP080: Ethylbenzene	100-41-4	25 µg/L	94.8	70	130	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	96.4	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	25 µg/L	94.5	70	130	
		EP080: Naphthalene	91-20-3	25 µg/L	91.6	70	130	





### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
					MS	MSD	Low	High	Value	Control Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3157454)</b>											
ES1324555-005	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	113	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3157454)</b>											
ES1324555-005	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	115	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3157454)</b>											
ES1324555-005	Anonymous	EP080: Benzene	71-43-2	25 µg/L	90.0	----	70	130	----	----	
		EP080: Toluene	108-88-3	25 µg/L	103	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	25 µg/L	99.4	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	100	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	25 µg/L	106	----	70	130	----	----	
		EP080: Naphthalene	91-20-3	25 µg/L	103	----	70	130	----	----	
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3157724)</b>											
ES1324555-001	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	80.2	----	70	130	----	----	
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3157725)</b>											
ES1324555-003	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	123	----	70	130	----	----	
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	120	----	70	130	----	----	
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	119	----	70	130	----	----	
		EG020A-F: Copper	7440-50-8	0.2 mg/L	117	----	70	130	----	----	
		EG020A-F: Lead	7439-92-1	0.2 mg/L	109	----	70	130	----	----	
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	# Not Determined	----	70	130	----	----	
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	122	----	70	130	----	----	
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	128	----	70	130	----	----	
<b>ED045G: Chloride Discrete analyser (QCLot: 3158892)</b>											
ES1324238-001	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	# Not Determined	----	70	130	----	----	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3158893)</b>											
ES1324238-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3159665)</b>											
ES1324631-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	125	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3159665)</b>											
ES1324631-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	122	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3159665)</b>											



Sub-Matrix: **WATER**

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
					MS	MSD	Low	High	Value	Control Limit	
<b>EP080: BTEXN (QCLot: 3159665) - continued</b>											
ES1324631-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	117	----	70	130	----	----	
		EP080: Toluene	108-88-3	25 µg/L	110	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	25 µg/L	113	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	112	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	25 µg/L	114	----	70	130	----	----	
	EP080: Naphthalene	91-20-3	25 µg/L	118	----	70	130	----	----		
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3159667)</b>											
ES1324554-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	123	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3159667)</b>											
ES1324554-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	121	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3159667)</b>											
ES1324554-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	97.5	----	70	130	----	----	
		EP080: Toluene	108-88-3	25 µg/L	104	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	25 µg/L	94.8	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	96.4	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	25 µg/L	94.5	----	70	130	----	----	
	EP080: Naphthalene	91-20-3	25 µg/L	91.6	----	70	130	----	----		
<b>EK040P: Fluoride by PC Titrator (QCLot: 3164327)</b>											
ES1324554-001	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	102	----	70	130	----	----	

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1324556</b>	Page	: 1 of 9
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: WALLERAWANG MT PIPER GW	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 12-NOV-2013
C-O-C number	: ----	Issue Date	: 20-NOV-2013
Sampler	: DB/SH	No. of samples received	: 8
Order number	: 0207423/0207420	No. of samples analysed	: 8
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>ED037P: Alkalinity by PC Titrator</b>							
Clear Plastic Bottle - Natural (ED037-P) RB_GW7_061113	05-NOV-2013	---	19-NOV-2013	----	18-NOV-2013	19-NOV-2013	✓
Clear Plastic Bottle - Natural (ED037-P) MH_X_D17, MG_X_4/D4, D04_GW_081113, RB_GW9_081113	08-NOV-2013	---	22-NOV-2013	----	18-NOV-2013	22-NOV-2013	✓
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>							
Clear Plastic Bottle - Natural (ED041G) RB_GW7_061113	05-NOV-2013	---	03-DEC-2013	----	14-NOV-2013	03-DEC-2013	✓
Clear Plastic Bottle - Natural (ED041G) MH_X_D17, MG_X_4/D4, D04_GW_081113, RB_GW9_081113	08-NOV-2013	---	06-DEC-2013	----	14-NOV-2013	06-DEC-2013	✓
<b>ED045G: Chloride Discrete analyser</b>							
Clear Plastic Bottle - Natural (ED045G) RB_GW7_061113	05-NOV-2013	---	03-DEC-2013	----	14-NOV-2013	03-DEC-2013	✓
Clear Plastic Bottle - Natural (ED045G) MH_X_D17, MG_X_4/D4, D04_GW_081113, RB_GW9_081113	08-NOV-2013	---	06-DEC-2013	----	14-NOV-2013	06-DEC-2013	✓
<b>ED093F: Dissolved Major Cations</b>							
Clear Plastic Bottle - Natural (ED093F) RB_GW7_061113	05-NOV-2013	---	12-NOV-2013	----	14-NOV-2013	12-NOV-2013	✗
Clear Plastic Bottle - Natural (ED093F) MH_X_D17, MG_X_4/D4, D04_GW_081113, RB_GW9_081113	08-NOV-2013	---	15-NOV-2013	----	14-NOV-2013	15-NOV-2013	✓
<b>EG020F: Dissolved Metals by ICP-MS</b>							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) RB_GW7_061113	05-NOV-2013	---	04-MAY-2014	----	14-NOV-2013	04-MAY-2014	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) MH_X_D17, MH_X_D19, MG_X_4/D4, D04_GW_081113, RB_GW9_081113	08-NOV-2013	---	07-MAY-2014	----	14-NOV-2013	07-MAY-2014	✓



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EG035F: Dissolved Mercury by FIMS</b>							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) RB_GW7_061113	05-NOV-2013	---	03-DEC-2013	----	15-NOV-2013	03-DEC-2013	✔
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) MH_X_D17, MG_X_4/D4, RB_GW9_081113 MH_X_D19, D04_GW_081113,	08-NOV-2013	---	06-DEC-2013	----	15-NOV-2013	06-DEC-2013	✔
<b>EK040P: Fluoride by PC Titrator</b>							
Clear Plastic Bottle - Natural (EK040P) RB_GW7_061113	05-NOV-2013	---	03-DEC-2013	----	18-NOV-2013	03-DEC-2013	✔
Clear Plastic Bottle - Natural (EK040P) MH_X_D17, D04_GW_081113, MG_X_4/D4, RB_GW9_081113	08-NOV-2013	---	06-DEC-2013	----	18-NOV-2013	06-DEC-2013	✔
<b>EP080/071: Total Petroleum Hydrocarbons</b>							
Amber Glass Bottle - Unpreserved (EP071) RB_GW7_061113	05-NOV-2013	13-NOV-2013	12-NOV-2013	✖	18-NOV-2013	24-DEC-2013	✔
Amber Glass Bottle - Unpreserved (EP071) MH_X_D17, MG_X_4/D4, RB_GW9_081113 MH_X_D19, D04_GW_081113,	08-NOV-2013	14-NOV-2013	15-NOV-2013	✔	15-NOV-2013	24-DEC-2013	✔
<b>EP075(SIM)A: Phenolic Compounds</b>							
Amber Glass Bottle - Unpreserved (EP075(SIM)) RB_GW7_061113	05-NOV-2013	13-NOV-2013	12-NOV-2013	✖	18-NOV-2013	24-DEC-2013	✔
Amber Glass Bottle - Unpreserved (EP075(SIM)) MH_X_D17, MG_X_4/D4, RB_GW9_081113 MH_X_D19, D04_GW_081113,	08-NOV-2013	14-NOV-2013	15-NOV-2013	✔	15-NOV-2013	24-DEC-2013	✔
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>							
Amber Glass Bottle - Unpreserved (EP075(SIM)) RB_GW7_061113	05-NOV-2013	13-NOV-2013	12-NOV-2013	✖	18-NOV-2013	24-DEC-2013	✔
Amber Glass Bottle - Unpreserved (EP075(SIM)) MH_X_D17, MG_X_4/D4, RB_GW9_081113 MH_X_D19, D04_GW_081113,	08-NOV-2013	14-NOV-2013	15-NOV-2013	✔	15-NOV-2013	24-DEC-2013	✔
<b>EP080: BTEXN</b>							
Amber VOC Vial - Sulfuric Acid (EP080) RB_GW7_061113	05-NOV-2013	15-NOV-2013	19-NOV-2013	✔	15-NOV-2013	19-NOV-2013	✔
Amber VOC Vial - Sulfuric Acid (EP080) MH_X_D17, MG_X_4/D4, RB_GW9_081113 MH_X_D19, D04_GW_081113,	08-NOV-2013	15-NOV-2013	22-NOV-2013	✔	15-NOV-2013	22-NOV-2013	✔
Amber VOC Vial - Sulfuric Acid (EP080) TS,	30-OCT-2013	13-NOV-2013	13-NOV-2013	✔	13-NOV-2013	13-NOV-2013	✔



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP080/071: Total Petroleum Hydrocarbons</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> RB_GW7_061113	05-NOV-2013	15-NOV-2013	19-NOV-2013	✓	15-NOV-2013	19-NOV-2013	✓
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MH_X_D17, MG_X_4/D4, RB_GW9_081113	MH_X_D19, D04_GW_081113, 08-NOV-2013	15-NOV-2013	22-NOV-2013	✓	15-NOV-2013	22-NOV-2013	✓
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> TB	30-OCT-2013	13-NOV-2013	13-NOV-2013	✓	13-NOV-2013	13-NOV-2013	✓





## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Alkalinity by PC Titrator	ED037-P	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	18	11.1	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	5	44	11.4	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
Alkalinity by PC Titrator	ED037-P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	2	17	11.8	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	21	9.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	3	44	6.8	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
Chloride by Discrete Analyser	ED045G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	2	17	11.8	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	21	9.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	3	44	6.8	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
Chloride by Discrete Analyser	ED045G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	3	44	6.8	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Sulfate (Turbidimetric) as SO <sub>4</sub> <sup>2-</sup> by Discrete Analyser	ED041G	WATER	APHA 21st ed., 4500-SO <sub>4</sub> Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> <sup>2-</sup> concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Chloride by Discrete Analyser	ED045G	WATER	APHA 21st ed., 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	Major Cations is determined based on APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um filtered sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Hardness parameters are calculated based on APHA 21st ed., 2340 B. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): Samples are 0.45 um filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) Samples are 0.45 um filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Fluoride by PC Titrator	EK040P	WATER	APHA 21st ed., 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Ionic Balance by PCT DA and Turbi SO <sub>4</sub> DA	EN055 - PG	WATER	APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by Turbi SO <sub>4</sub> by DA. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)



<i>Analytical Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
TPH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
TPH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Separatory Funnel Extraction of Liquids	ORG14	WATER	USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.



## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Matrix Spike (MS) Recoveries</b>							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	ES1324238-001	Anonymous	Sulfate as SO4 - Turbidimetric	14808-79-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
ED045G: Chloride Discrete analyser	ES1324238-001	Anonymous	Chloride	16887-00-6	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG020F: Dissolved Metals by ICP-MS	ES1324555-003	Anonymous	Manganese	7439-96-5	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.

#### Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

Matrix: **WATER**

Method	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
<b>ED093F: Dissolved Major Cations</b>						
Clear Plastic Bottle - Natural RB_GW7_061113	----	----	----	14-NOV-2013	12-NOV-2013	2
<b>EP075(SIM)A: Phenolic Compounds</b>						
Amber Glass Bottle - Unpreserved RB_GW7_061113	13-NOV-2013	12-NOV-2013	1	----	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>						
Amber Glass Bottle - Unpreserved RB_GW7_061113	13-NOV-2013	12-NOV-2013	1	----	----	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>						



Matrix: **WATER**

Method Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
<b>EP080/071: Total Petroleum Hydrocarbons - Analysis Holding Time Compliance</b>						
<b>Amber Glass Bottle - Unpreserved</b> RB_GW7_061113	13-NOV-2013	12-NOV-2013	1	----	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>						
<b>Amber Glass Bottle - Unpreserved</b> RB_GW7_061113	13-NOV-2013	12-NOV-2013	1	----	----	----

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- **No Quality Control Sample Frequency Outliers exist.**

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

**Work Order : ES1324556**

<p><b>Client : ENVIRO RESOURCES MANAGEMENT</b></p> <p><b>Contact : MR JONATHAN LEKAWSKI</b></p> <p><b>Address : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007</b></p>	<p><b>Laboratory : Environmental Division Sydney</b></p> <p><b>Contact : Barbara Hanna</b></p> <p><b>Address : 277-289 Woodpark Road Smithfield NSW Australia 2164</b></p>
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<p><b>E-mail : jonathan.lekawski@erm.com</b></p> <p><b>Telephone : +61 02 8584 8888</b></p> <p><b>Facsimile : +61 02 8584 8800</b></p>	<p><b>E-mail : Barbara.Hanna@alsglobal.com</b></p> <p><b>Telephone : +61 2 8784 8555</b></p> <p><b>Facsimile : +61 2 8784 8555</b></p>
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<p><b>Project : WALLERAWANG MT PIPER GW</b></p> <p><b>Order number : 0207423/0207420</b></p> <p><b>C-O-C number : ----</b></p> <p><b>Site : ----</b></p> <p><b>Sampler : DB/SH</b></p>	<p><b>Page : 1 of 2</b></p> <p><b>Quote number : ES2013ENVRES0370 (SY/278/13 V3)</b></p> <p><b>QC Level : NEPM 2013 Schedule B(3) and ALS QCS3 requirement</b></p>
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#### Dates

<p><b>Date Samples Received : 12-NOV-2013</b></p> <p><b>Client Requested Due Date : 20-NOV-2013</b></p>	<p><b>Issue Date : 13-NOV-2013 19:31</b></p> <p><b>Scheduled Reporting Date : 20-NOV-2013</b></p>
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#### Delivery Details

<p><b>Mode of Delivery : Carrier</b></p> <p><b>No. of coolers/boxes : 1 HARD</b></p> <p><b>Security Seal : Intact.</b></p>	<p><b>Temperature : 3.0°C - Ice present</b></p> <p><b>No. of samples received : 8</b></p> <p><b>No. of samples analysed : 8</b></p>
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#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Sample T01\_GW\_081113 to be forwarded to Envirolab.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.





## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EG020F Dissolved Metals by ICPMS	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP080 BTEXN	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02A Major Anions (Chloride, Sulphate, Fluoride,	WATER - W-18 TRH(C6 - C9)/BTEXN	WATER - W-27 TRH/BTEXN/PAH/Phenols/8 Metals
ES1324556-001	08-NOV-2013 15:00	MH_X_D17	✓	✓		✓	✓		✓
ES1324556-002	08-NOV-2013 15:00	MH_X_D19	✓						✓
ES1324556-003	08-NOV-2013 15:00	MG_X_4/D4	✓	✓		✓	✓		✓
ES1324556-004	08-NOV-2013 15:00	D04_GW_081113	✓	✓		✓	✓		✓
ES1324556-005	05-NOV-2013 15:00	RB_GW7_061113	✓	✓		✓	✓		✓
ES1324556-006	08-NOV-2013 15:00	RB_GW9_081113	✓	✓		✓	✓		✓
ES1324556-007	30-OCT-2013 15:00	TS			✓				
ES1324556-008	30-OCT-2013 15:00	TB						✓	

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
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Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com



## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>ES1327282</b> <b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : MR JONATHAN LEKAWSKI <b>Address</b> : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007  <b>E-mail</b> : jonathan.lekawski@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800 <b>Project</b> : SYMPHONY - DELTA WEST <b>Order number</b> : 0207420/0207423 <b>C-O-C number</b> : ---- <b>Sampler</b> : AA <b>Site</b> : ----  <b>Quote number</b> : SY/551/13 V4	<b>Page</b> : 1 of 14  <b>Laboratory</b> : Environmental Division Sydney <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164  <b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555 <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement  <b>Date Samples Received</b> : 13-DEC-2013 <b>Issue Date</b> : 23-DEC-2013  <b>No. of samples received</b> : 2 <b>No. of samples analysed</b> : 2
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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics



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## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EG035: Positive mercury results have been confirmed by re-analysis**
- **EP075(SIM): LOR raised due high moisture content.**



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

MA\_SS01\_S

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Client sampling date / time

12-DEC-2013 15:00

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Compound	CAS Number	LOR	Unit	ES1327282-002	---	---	---	---
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	---	1.0	%	56.7	---	---	---	---
<b>EG020-SD: Total Metals in Sediments by ICPMS</b>								
Arsenic	7440-38-2	1.00	mg/kg	11.0	---	---	---	---
Cadmium	7440-43-9	0.1	mg/kg	0.2	---	---	---	---
Chromium	7440-47-3	1.0	mg/kg	5.2	---	---	---	---
Copper	7440-50-8	1.0	mg/kg	11.7	---	---	---	---
Lead	7439-92-1	1.0	mg/kg	12.4	---	---	---	---
Manganese	7439-96-5	10	mg/kg	534	---	---	---	---
Nickel	7440-02-0	1.0	mg/kg	282	---	---	---	---
Selenium	7782-49-2	0.1	mg/kg	0.6	---	---	---	---
Zinc	7440-66-6	1.0	mg/kg	384	---	---	---	---
<b>EG020T: Total Metals by ICP-MS</b>								
Boron	7440-42-8	5	mg/kg	6	---	---	---	---
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.01	mg/kg	0.03	---	---	---	---
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	<0.5	---	---	---	---
Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	---	---	---	---
n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	---	---	---	---
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	---	---	---	---
sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	---	---	---	---
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	---	---	---	---
tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	---	---	---	---
p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	---	---	---	---
n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	---	---	---	---
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	<5	---	---	---	---
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	---	---	---	---
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	---	---	---	---
2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	---	---	---	---
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	---	---	---	---
<b>EP074D: Fumigants</b>								



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

MA\_SS01\_S

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Client sampling date / time

12-DEC-2013 15:00

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Compound	CAS Number	LOR	Unit	ES1327282-002	---	---	---	---
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### EP074D: Fumigants - Continued

2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	---	---	---	---
1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	---	---	---	---
cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	---	---	---	---
trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	---	---	---	---
1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	---	---	---	---

### EP074E: Halogenated Aliphatic Compounds

Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	---	---	---	---
Chloromethane	74-87-3	5	mg/kg	<5	---	---	---	---
Vinyl chloride	75-01-4	5	mg/kg	<5	---	---	---	---
Bromomethane	74-83-9	5	mg/kg	<5	---	---	---	---
Chloroethane	75-00-3	5	mg/kg	<5	---	---	---	---
Trichlorofluoromethane	75-69-4	5	mg/kg	<5	---	---	---	---
1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	---	---	---	---
Iodomethane	74-88-4	0.5	mg/kg	<0.5	---	---	---	---
trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	---	---	---	---
1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	---	---	---	---
cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	---	---	---	---
1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	---	---	---	---
1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	---	---	---	---
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	---	---	---	---
1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	---	---	---	---
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	---	---	---	---
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	---	---	---	---
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	---	---	---	---
1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	---	---	---	---
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	---	---	---	---
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	---	---	---	---
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	---	---	---	---
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	---	---	---	---
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	---	---	---	---
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	---	---	---	---
Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	---	---	---	---
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	---	---	---	---
Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	---	---	---	---





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

MA\_SS01\_S

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Client sampling date / time

12-DEC-2013 15:00

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Compound	CAS Number	LOR	Unit	ES1327282-002	---	---	---	---
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### EP074E: Halogenated Aliphatic Compounds - Continued

### EP074F: Halogenated Aromatic Compounds

Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	---	---	---	---
Bromobenzene	108-86-1	0.5	mg/kg	<0.5	---	---	---	---
2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	---	---	---	---
4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	---	---	---	---
1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	---	---	---	---
1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	---	---	---	---
1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	---	---	---	---
1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	---	---	---	---
1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	---	---	---	---

### EP074G: Trihalomethanes

Chloroform	67-66-3	0.5	mg/kg	<0.5	---	---	---	---
Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	---	---	---	---
Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	---	---	---	---
Bromoform	75-25-2	0.5	mg/kg	<0.5	---	---	---	---

### EP074H: Naphthalene

Naphthalene	91-20-3	5	mg/kg	<5	---	---	---	---
-------------	---------	---	-------	----	-----	-----	-----	-----

### EP075(SIM)A: Phenolic Compounds

Phenol	108-95-2	0.5	mg/kg	<0.8	---	---	---	---
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.8	---	---	---	---
2-Methylphenol	95-48-7	0.5	mg/kg	<0.8	---	---	---	---
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<2	---	---	---	---
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.8	---	---	---	---
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.8	---	---	---	---
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.8	---	---	---	---
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.8	---	---	---	---
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.8	---	---	---	---
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.8	---	---	---	---
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.8	---	---	---	---
Pentachlorophenol	87-86-5	2	mg/kg	<2	---	---	---	---

### EP075(SIM)B: Polynuclear Aromatic Hydrocarbons

Naphthalene	91-20-3	0.5	mg/kg	<0.8	---	---	---	---
Acenaphthylene	208-96-8	0.5	mg/kg	<0.8	---	---	---	---



**Analytical Results**

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

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Client sampling date / time

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ES1327282-002

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**EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued**

Compound	CAS Number	LOR	Unit					
Acenaphthene	83-32-9	0.5	mg/kg	<0.8	---	---	---	---
Fluorene	86-73-7	0.5	mg/kg	<0.8	---	---	---	---
Phenanthrene	85-01-8	0.5	mg/kg	<0.8	---	---	---	---
Anthracene	120-12-7	0.5	mg/kg	<0.8	---	---	---	---
Fluoranthene	206-44-0	0.5	mg/kg	<0.8	---	---	---	---
Pyrene	129-00-0	0.5	mg/kg	<0.8	---	---	---	---
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.8	---	---	---	---
Chrysene	218-01-9	0.5	mg/kg	<0.8	---	---	---	---
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.8	---	---	---	---
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.8	---	---	---	---
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.8	---	---	---	---
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.8	---	---	---	---
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.8	---	---	---	---
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.8	---	---	---	---
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	---	---	---	---
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	---	---	---	---
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	1.0	---	---	---	---
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.9	---	---	---	---

**EP080/071: Total Petroleum Hydrocarbons**

C6 - C9 Fraction	----	10	mg/kg	<10	---	---	---	---
C10 - C14 Fraction	----	50	mg/kg	<50	---	---	---	---
C15 - C28 Fraction	----	100	mg/kg	140	---	---	---	---
C29 - C36 Fraction	----	100	mg/kg	<100	---	---	---	---
^ C10 - C36 Fraction (sum)	----	50	mg/kg	140	---	---	---	---

**EP080/071: Total Recoverable Hydrocarbons - NEPM 2013**

C6 - C10 Fraction	C6_C10	10	mg/kg	<10	---	---	---	---
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	---	---	---	---
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	---	---	---	---
>C16 - C34 Fraction	----	100	mg/kg	180	---	---	---	---
>C34 - C40 Fraction	----	100	mg/kg	<100	---	---	---	---
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	180	---	---	---	---
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	---	---	---	---



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

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Client sampling date / time

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Compound	CAS Number	LOR	Unit	ES1327282-002	---	---	---	---
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	---	---	---	---
Toluene	108-88-3	0.5	mg/kg	<0.5	---	---	---	---
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	---	---	---	---
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	---	---	---	---
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	---	---	---	---
^ Sum of BTEX	----	0.2	mg/kg	<0.2	---	---	---	---
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	---	---	---	---
Naphthalene	91-20-3	1	mg/kg	<1	---	---	---	---
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	84.8	---	---	---	---
Toluene-D8	2037-26-5	0.1	%	83.0	---	---	---	---
4-Bromofluorobenzene	460-00-4	0.1	%	74.3	---	---	---	---
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	85.8	---	---	---	---
2-Chlorophenol-D4	93951-73-6	0.1	%	85.3	---	---	---	---
2,4,6-Tribromophenol	118-79-6	0.1	%	70.0	---	---	---	---
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	93.3	---	---	---	---
Anthracene-d10	1719-06-8	0.1	%	83.3	---	---	---	---
4-Terphenyl-d14	1718-51-0	0.1	%	73.5	---	---	---	---
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	75.2	---	---	---	---
Toluene-D8	2037-26-5	0.1	%	76.7	---	---	---	---
4-Bromofluorobenzene	460-00-4	0.1	%	73.1	---	---	---	---



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

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Compound	CAS Number	LOR	Unit	ES1327282-001	---	---	---	---
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	---	---	---	---
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	---	---	---	---
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	56	---	---	---	---
Total Alkalinity as CaCO3	----	1	mg/L	56	---	---	---	---
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	210	---	---	---	---
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	19	---	---	---	---
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	28	---	---	---	---
Magnesium	7439-95-4	1	mg/L	34	---	---	---	---
Sodium	7440-23-5	1	mg/L	23	---	---	---	---
Potassium	7440-09-7	1	mg/L	7	---	---	---	---
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	0.0003	---	---	---	---
<b>EG094T: Total metals in Fresh water by ORC-ICPMS</b>								
Selenium	7782-49-2	0.2	µg/L	3.4	---	---	---	---
Arsenic	7440-38-2	0.2	µg/L	24.7	---	---	---	---
Boron	7440-42-8	5	µg/L	28	---	---	---	---
Cadmium	7440-43-9	0.05	µg/L	0.95	---	---	---	---
Chromium	7440-47-3	0.2	µg/L	12.6	---	---	---	---
Copper	7440-50-8	0.5	µg/L	72.8	---	---	---	---
Lead	7439-92-1	0.1	µg/L	87.8	---	---	---	---
Manganese	7439-96-5	0.5	µg/L	22300	---	---	---	---
Nickel	7440-02-0	0.5	µg/L	1770	---	---	---	---
Zinc	7440-66-6	1	µg/L	2380	---	---	---	---
<b>EK040P: Fluoride by PC Titrator</b>								
Fluoride	16984-48-8	0.1	mg/L	<0.1	---	---	---	---
<b>EN055: Ionic Balance</b>								
Total Anions	----	0.01	meq/L	6.03	---	---	---	---
Total Cations	----	0.01	meq/L	5.85	---	---	---	---
Ionic Balance	----	0.01	%	1.52	---	---	---	---
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

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Compound	CAS Number	LOR	Unit	ES1327282-001	---	---	---	---
<b>EP074A: Monocyclic Aromatic Hydrocarbons - Continued</b>								
Styrene	100-42-5	5	µg/L	<5	---	---	---	---
Isopropylbenzene	98-82-8	5	µg/L	<5	---	---	---	---
n-Propylbenzene	103-65-1	5	µg/L	<5	---	---	---	---
1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	---	---	---	---
sec-Butylbenzene	135-98-8	5	µg/L	<5	---	---	---	---
1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	---	---	---	---
tert-Butylbenzene	98-06-6	5	µg/L	<5	---	---	---	---
p-Isopropyltoluene	99-87-6	5	µg/L	<5	---	---	---	---
n-Butylbenzene	104-51-8	5	µg/L	<5	---	---	---	---
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	50	µg/L	<50	---	---	---	---
2-Butanone (MEK)	78-93-3	50	µg/L	<50	---	---	---	---
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	---	---	---	---
2-Hexanone (MBK)	591-78-6	50	µg/L	<50	---	---	---	---
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	5	µg/L	<5	---	---	---	---
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	5	µg/L	<5	---	---	---	---
1,2-Dichloropropane	78-87-5	5	µg/L	<5	---	---	---	---
cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	---	---	---	---
trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	---	---	---	---
1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	---	---	---	---
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	50	µg/L	<50	---	---	---	---
Chloromethane	74-87-3	50	µg/L	<50	---	---	---	---
Vinyl chloride	75-01-4	50	µg/L	<50	---	---	---	---
Bromomethane	74-83-9	50	µg/L	<50	---	---	---	---
Chloroethane	75-00-3	50	µg/L	<50	---	---	---	---
Trichlorofluoromethane	75-69-4	50	µg/L	<50	---	---	---	---
1,1-Dichloroethene	75-35-4	5	µg/L	<5	---	---	---	---
Iodomethane	74-88-4	5	µg/L	<5	---	---	---	---
trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	---	---	---	---
1,1-Dichloroethane	75-34-3	5	µg/L	<5	---	---	---	---



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

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Client sampling date / time

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Compound	CAS Number	LOR	Unit	ES1327282-001	---	---	---	---
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	---	---	---	---
1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	---	---	---	---
1,1-Dichloropropylene	563-58-6	5	µg/L	<5	---	---	---	---
Carbon Tetrachloride	56-23-5	5	µg/L	<5	---	---	---	---
1,2-Dichloroethane	107-06-2	5	µg/L	<5	---	---	---	---
Trichloroethene	79-01-6	5	µg/L	<5	---	---	---	---
Dibromomethane	74-95-3	5	µg/L	<5	---	---	---	---
1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	---	---	---	---
1,3-Dichloropropane	142-28-9	5	µg/L	<5	---	---	---	---
Tetrachloroethene	127-18-4	5	µg/L	<5	---	---	---	---
1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	---	---	---	---
trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	---	---	---	---
cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	---	---	---	---
1,1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	---	---	---	---
1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	---	---	---	---
Pentachloroethane	76-01-7	5	µg/L	<5	---	---	---	---
1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	---	---	---	---
Hexachlorobutadiene	87-68-3	5	µg/L	<5	---	---	---	---
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	5	µg/L	<5	---	---	---	---
Bromobenzene	108-86-1	5	µg/L	<5	---	---	---	---
2-Chlorotoluene	95-49-8	5	µg/L	<5	---	---	---	---
4-Chlorotoluene	106-43-4	5	µg/L	<5	---	---	---	---
1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	---	---	---	---
1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	---	---	---	---
1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	---	---	---	---
1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	---	---	---	---
1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	---	---	---	---
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	5	µg/L	<5	---	---	---	---
Bromodichloromethane	75-27-4	5	µg/L	<5	---	---	---	---
Dibromochloromethane	124-48-1	5	µg/L	<5	---	---	---	---
Bromoform	75-25-2	5	µg/L	<5	---	---	---	---





## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

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Client sampling date / time

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Compound	CAS Number	LOR	Unit	ES1327282-001	---	---	---	---
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	7	µg/L	<7	---	---	---	---
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	1.0	µg/L	<1.0	---	---	---	---
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	---	---	---	---
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	---	---	---	---
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	---	---	---	---
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	---	---	---	---
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	---	---	---	---
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	---	---	---	---
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	---	---	---	---
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	---	---	---	---
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	---	---	---	---
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	---	---	---	---
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	---	---	---	---
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	1.0	µg/L	<1.0	---	---	---	---
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	---	---	---	---
Acenaphthene	83-32-9	1.0	µg/L	<1.0	---	---	---	---
Fluorene	86-73-7	1.0	µg/L	<1.0	---	---	---	---
Phenanthrene	85-01-8	1.0	µg/L	<1.0	---	---	---	---
Anthracene	120-12-7	1.0	µg/L	<1.0	---	---	---	---
Fluoranthene	206-44-0	1.0	µg/L	<1.0	---	---	---	---
Pyrene	129-00-0	1.0	µg/L	<1.0	---	---	---	---
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	---	---	---	---
Chrysene	218-01-9	1.0	µg/L	<1.0	---	---	---	---
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	---	---	---	---
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	---	---	---	---
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	---	---	---	---
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	---	---	---	---
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	---	---	---	---
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	---	---	---	---
^ Sum of polycyclic aromatic hydrocarbons	---	0.5	µg/L	<0.5	---	---	---	---
^ Benzo(a)pyrene TEQ (zero)	---	0.5	µg/L	<0.5	---	---	---	---



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

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Client sampling date / time

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Compound	CAS Number	LOR	Unit	ES1327282-001	---	---	---	---
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### EP080/071: Total Petroleum Hydrocarbons

C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----

### EP080/071: Total Recoverable Hydrocarbons - NEPM 2013

C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	----	----	----	----
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	----	----	----	----

### EP080: BTEXN

Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----
^ Total Xylenes	1330-20-7	2	µg/L	<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L	<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----

### EP074S: VOC Surrogates

1,2-Dichloroethane-D4	17060-07-0	0.1	%	123	----	----	----	----
Toluene-D8	2037-26-5	0.1	%	119	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	108	----	----	----	----

### EP075(SIM)S: Phenolic Compound Surrogates

Phenol-d6	13127-88-3	0.1	%	31.3	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	62.9	----	----	----	----
2,4,6-Tribromophenol	118-79-6	0.1	%	77.1	----	----	----	----

### EP075(SIM)T: PAH Surrogates

2-Fluorobiphenyl	321-60-8	0.1	%	79.1	----	----	----	----
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## Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Client sample ID

**MA\_SS01\_W**

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Client sampling date / time

12-DEC-2013 15:00

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Compound	CAS Number	LOR	Unit	ES1327282-001	----	----	----	----
<b>EP075(SIM)T: PAH Surrogates - Continued</b>								
<b>Anthracene-d10</b>	1719-06-8	0.1	%	<b>82.6</b>	----	----	----	----
<b>4-Terphenyl-d14</b>	1718-51-0	0.1	%	<b>91.6</b>	----	----	----	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
<b>1,2-Dichloroethane-D4</b>	17060-07-0	0.1	%	<b>109</b>	----	----	----	----
<b>Toluene-D8</b>	2037-26-5	0.1	%	<b>110</b>	----	----	----	----
<b>4-Bromofluorobenzene</b>	460-00-4	0.1	%	<b>101</b>	----	----	----	----



## Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP074S: VOC Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	64	130
Toluene-D8	2037-26-5	66	136
4-Bromofluorobenzene	460-00-4	60	122
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP074S: VOC Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	78.3	133.2
Toluene-D8	2037-26-5	79.1	128.9
4-Bromofluorobenzene	460-00-4	80.8	123.7
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	10.0	44
2-Chlorophenol-D4	93951-73-6	14	94
2,4,6-Tribromophenol	118-79-6	17	125
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27.4	113
4-Terphenyl-d14	1718-51-0	32	112
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: ES1327282</b>	<b>Page</b>	: 1 of 28
<b>Client</b>	<b>: ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: MR JONATHAN LEKAWSKI	<b>Contact</b>	: Barbara Hanna
<b>Address</b>	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: jonathan.lekawski@erm.com	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: SYMPHONY - DELTA WEST	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b>	: ----	<b>Date Samples Received</b>	: 13-DEC-2013
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: 23-DEC-2013
<b>Sampler</b>	: AA	<b>No. of samples received</b>	: 2
<b>Order number</b>	: 0207420/0207423	<b>No. of samples analysed</b>	: 2
<b>Quote number</b>	: SY/551/13 V4		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics



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## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :  
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
RPD = Relative Percentage Difference  
# = Indicates failed QC





## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EA055: Moisture Content (QC Lot: 3220471)</b>									
EM1313286-008	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	15.3	14.5	5.6	0% - 50%
ES1327396-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	19.3	14.9	25.6	0% - 50%
<b>EG020-SD: Total Metals in Sediments by ICPMS (QC Lot: 3220317)</b>									
ES1327282-002	MA_SS01_S	EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	0.2	0.1	0.0	No Limit
		EG020-SD: Selenium	7782-49-2	0.1	mg/kg	0.6	0.6	0.0	No Limit
		EG020-SD: Chromium	7440-47-3	1.0	mg/kg	5.2	4.8	7.3	No Limit
		EG020-SD: Copper	7440-50-8	1.0	mg/kg	11.7	10.9	7.4	0% - 50%
		EG020-SD: Lead	7439-92-1	1.0	mg/kg	12.4	10.5	16.7	0% - 50%
		EG020-SD: Nickel	7440-02-0	1.0	mg/kg	282	324	13.9	0% - 20%
		EG020-SD: Zinc	7440-66-6	1.0	mg/kg	384	443	14.3	0% - 20%
		EG020-SD: Arsenic	7440-38-2	1.00	mg/kg	11.0	9.98	9.9	0% - 50%
		EG020-SD: Manganese	7439-96-5	10	mg/kg	534	596	11.0	0% - 20%
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3220316)</b>									
ES1327282-002	MA_SS01_S	EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	0.03	0.03	0.0	No Limit
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3217254)</b>									
ES1327178-001	Anonymous	EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074B: Oxygenated Compounds (QC Lot: 3217254)</b>									
ES1327178-001	Anonymous	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.0	No Limit
<b>EP074C: Sulfonated Compounds (QC Lot: 3217254)</b>									
ES1327178-001	Anonymous	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074D: Fumigants (QC Lot: 3217254)</b>									
ES1327178-001	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074D: Fumigants (QC Lot: 3217254) - continued</b>									
ES1327178-001	Anonymous	EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3217254)</b>									
ES1327178-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.0	No Limit
EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.0	No Limit		
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.0	No Limit		
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3217254)</b>									
ES1327178-001	Anonymous	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3217254) - continued</b>									
ES1327178-001	Anonymous	EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074G: Trihalomethanes (QC Lot: 3217254)</b>									
ES1327178-001	Anonymous	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074H: Naphthalene (QC Lot: 3217254)</b>									
ES1327178-001	Anonymous	EP074: Naphthalene	91-20-3	5	mg/kg	<5	<5	0.0	No Limit
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3213843)</b>									
ES1327368-001	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
ES1327368-004	Anonymous	EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
		EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit		
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit		
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3213843)</b>									
ES1327368-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3213843) - continued</b>									
ES1327368-001	Anonymous	EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1327368-004	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3213842)</b>									
ES1327368-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1327368-004	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3217253)</b>									



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3217253) - continued</b>										
ES1327178-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3213842)</b>										
ES1327368-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit	
ES1327368-004	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3217253)</b>										
ES1327178-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit	
<b>EP080: BTEXN (QC Lot: 3217253)</b>										
ES1327178-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit		
<b>Sub-Matrix: WATER</b>										
Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
<b>ED037P: Alkalinity by PC Titrator (QC Lot: 3212263)</b>										
ES1327282-001	MA_SS01_W	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit	
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit	
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	56	55	2.0	0% - 20%	
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	56	55	2.0	0% - 20%	
ES1327339-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit	
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	4	<1	123	No Limit	
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	116	112	3.9	0% - 20%	
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	120	112	7.4	0% - 20%	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3215140)</b>										
ES1327282-001	MA_SS01_W	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	210	205	2.4	0% - 20%	
ES1327283-009	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	362	364	0.7	0% - 20%	
<b>ED045G: Chloride Discrete analyser (QC Lot: 3215139)</b>										
ES1327282-001	MA_SS01_W	ED045G: Chloride	16887-00-6	1	mg/L	19	20	5.3	0% - 20%	
ES1327283-009	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	13	12	0.0	0% - 50%	
<b>ED093F: Dissolved Major Cations (QC Lot: 3215138)</b>										
ES1327282-001	MA_SS01_W	ED093F: Calcium	7440-70-2	1	mg/L	28	28	0.0	0% - 20%	
		ED093F: Magnesium	7439-95-4	1	mg/L	34	34	0.0	0% - 20%	
		ED093F: Sodium	7440-23-5	1	mg/L	23	23	0.0	0% - 20%	



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>ED093F: Dissolved Major Cations (QC Lot: 3215138) - continued</b>									
ES1327282-001	MA_SS01_W	ED093F: Potassium	7440-09-7	1	mg/L	7	7	0.0	No Limit
ES1327283-010	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	31	31	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	15	15	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	59	58	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	7	7	0.0	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3213228)</b>									
ES1327088-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	0.0013	0.0014	9.1	0% - 50%
ES1327164-002	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
<b>EG094T: Total metals in Fresh water by ORC-ICPMS (QC Lot: 3223195)</b>									
ES1327322-001	Anonymous	EG094A-T: Cadmium	7440-43-9	0.05	µg/L	0.37	0.32	14.4	No Limit
		EG094A-T: Lead	7439-92-1	0.1	µg/L	4.2	3.7	11.0	0% - 20%
		EG094A-T: Arsenic	7440-38-2	0.2	µg/L	5.6	5.4	4.3	0% - 20%
		EG094A-T: Chromium	7440-47-3	0.2	µg/L	2.0	1.8	11.1	No Limit
		EG094A-T: Copper	7440-50-8	0.5	µg/L	1.4	1.1	17.2	No Limit
		EG094A-T: Manganese	7439-96-5	0.5	µg/L	210	186	11.9	0% - 20%
		EG094A-T: Nickel	7440-02-0	0.5	µg/L	4.7	4.3	8.9	No Limit
		EG094A-T: Zinc	7440-66-6	1	µg/L	23	20	12.3	0% - 20%
		EG094A-T: Boron	7440-42-8	5	µg/L	16	15	0.0	No Limit
<b>EG094T: Total metals in Fresh water by ORC-ICPMS (QC Lot: 3223196)</b>									
ES1327322-001	Anonymous	EG094B-T: Selenium	7782-49-2	0.2	µg/L	0.4	0.4	0.0	No Limit
<b>EK040P: Fluoride by PC Titrator (QC Lot: 3212262)</b>									
ES1327281-001	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
ES1327281-004	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.0	No Limit
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3218288)</b>									
ES1327317-002	Anonymous	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
ES1327317-010	Anonymous	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit





Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3218288) - continued</b>									
ES1327317-010	Anonymous	EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
<b>EP074B: Oxygenated Compounds (QC Lot: 3218288)</b>									
ES1327317-002	Anonymous	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
ES1327317-010	Anonymous	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
<b>EP074C: Sulfonated Compounds (QC Lot: 3218288)</b>									
ES1327317-002	Anonymous	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
ES1327317-010	Anonymous	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
<b>EP074D: Fumigants (QC Lot: 3218288)</b>									
ES1327317-002	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
ES1327317-010	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3218288)</b>									
ES1327317-002	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3218288) - continued</b>									
ES1327317-002	Anonymous	EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit		
ES1327317-010	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3218288) - continued</b>									
ES1327317-010	Anonymous	EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3218288)</b>									
ES1327317-002	Anonymous	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
ES1327317-010	Anonymous	EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
ES1327317-010	Anonymous	EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
ES1327317-010	Anonymous	EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
<b>EP074G: Trihalomethanes (QC Lot: 3218288)</b>									
ES1327317-002	Anonymous	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
ES1327317-010	Anonymous	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
<b>EP074H: Naphthalene (QC Lot: 3218288)</b>									
ES1327317-002	Anonymous	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit
ES1327317-010	Anonymous	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3213904)</b>									
ES1327431-001	Anonymous	EP075(SIM): Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3213904) - continued</b>									
ES1327431-001	Anonymous	EP075(SIM): 2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	0.0	No Limit
ES1327435-006	Anonymous	EP075(SIM): Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	0.0	No Limit
		<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3213904)</b>							
ES1327431-001	Anonymous	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Indeno(1,2,3-cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		ES1327435-006	Anonymous	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5
EP075(SIM): Naphthalene	91-20-3			1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): Acenaphthylene	208-96-8			1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): Acenaphthene	83-32-9			1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): Fluorene	86-73-7			1.0	µg/L	<1.0	<1.0	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3213904) - continued</b>										
ES1327435-006	Anonymous	EP075(SIM): Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit	
		EP075(SIM): Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit	
		EP075(SIM): Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit	
		EP075(SIM): Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit	
		EP075(SIM): Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit	
		EP075(SIM): Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit	
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit	
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit	
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit	
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit			
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3213903)</b>										
ES1327431-001	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.0	No Limit	
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit	
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit	
ES1327435-006	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.0	No Limit	
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit	
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3218289)</b>										
ES1327317-002	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit	
ES1327317-010	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3213903)</b>										
ES1327431-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	0.0	No Limit	
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit	
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit	
ES1327435-006	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	0.0	No Limit	
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit	
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3218289)</b>										
ES1327317-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit	
ES1327317-010	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit	
<b>EP080: BTEXN (QC Lot: 3218289)</b>										
ES1327317-002	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit	
ES1327317-010	Anonymous	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit	
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit	

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 Work Order : ES1327282  
 Client : ENVIRO RESOURCES MANAGEMENT  
 Project : SYMPHONY - DELTA WEST



Sub-Matrix: **WATER**

*Laboratory Duplicate (DUP) Report*

<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>LOR</i>	<i>Unit</i>	<i>Original Result</i>	<i>Duplicate Result</i>	<i>RPD (%)</i>	<i>Recovery Limits (%)</i>
<b>EP080: BTEXN (QC Lot: 3218289) - continued</b>									
ES1327317-010	Anonymous	EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit		





## Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EG020-SD: Total Metals in Sediments by ICPMS (QCLot: 3220317)</b>									
EG020-SD: Arsenic	7440-38-2	1.0	mg/kg	<1.00	21.7 mg/kg	136	81	139	
EG020-SD: Cadmium	7440-43-9	0.1	mg/kg	<0.1	4.64 mg/kg	125	82	126	
EG020-SD: Chromium	7440-47-3	1.0	mg/kg	<1.0	43.9 mg/kg	98.6	67	129	
EG020-SD: Copper	7440-50-8	1.0	mg/kg	<1.0	32 mg/kg	115	80	136	
EG020-SD: Lead	7439-92-1	1.0	mg/kg	<1.0	40 mg/kg	92.8	75	131	
EG020-SD: Manganese	7439-96-5	10	mg/kg	<10	130 mg/kg	109	77	133	
EG020-SD: Nickel	7440-02-0	1.0	mg/kg	<1.0	55 mg/kg	120	76	128	
EG020-SD: Selenium	7782-49-2	0.1	mg/kg	<0.1	5.37 mg/kg	86.7	72	134	
EG020-SD: Zinc	7440-66-6	1.0	mg/kg	<1.0	60.8 mg/kg	134	83	137	
<b>EG020T: Total Metals by ICP-MS (QCLot: 3220315)</b>									
EG020T: Boron	7440-42-8	0.1	mg/kg	<0.5	----	----	----	----	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3220316)</b>									
EG035T-LL: Mercury	7439-97-6	0.01	mg/kg	<0.01	0.110 mg/kg	99.5	72	116	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3217254)</b>									
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	93.6	64	126	
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	97.8	66	128	
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	95.3	63	129	
EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	95.7	63	129	
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	99.9	64	130	
EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	96.5	63	129	
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	94.4	63	129	
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	98.9	62	130	
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	101	61	131	
<b>EP074B: Oxygenated Compounds (QCLot: 3217254)</b>									
EP074: Vinyl Acetate	108-05-4	1	mg/kg	----	10 mg/kg	95.7	29.6	156	
		5	mg/kg	<5	----	----	----	----	
EP074: 2-Butanone (MEK)	78-93-3	1	mg/kg	----	10 mg/kg	92.0	58	136	
		5	mg/kg	<5	----	----	----	----	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	1	mg/kg	----	10 mg/kg	92.1	54	138	
		5	mg/kg	<5	----	----	----	----	
EP074: 2-Hexanone (MBK)	591-78-6	1	mg/kg	----	10 mg/kg	98.7	54	136	
		5	mg/kg	<5	----	----	----	----	
<b>EP074C: Sulfonated Compounds (QCLot: 3217254)</b>									
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	102	54	126	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074D: Fumigants (QCLot: 3217254)</b>									
EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	101	55	133	
EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	96.5	69	127	
EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	77.8	54	124	
EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	73.8	51	125	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	91.7	66	126	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3217254)</b>									
EP074: Dichlorodifluoromethane	75-71-8	1	mg/kg	----	10 mg/kg	117	30	148	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloromethane	74-87-3	1	mg/kg	----	10 mg/kg	109	41	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Vinyl chloride	75-01-4	1	mg/kg	----	10 mg/kg	113	43	147	
		5	mg/kg	<5	----	----	----	----	
EP074: Bromomethane	74-83-9	1	mg/kg	----	10 mg/kg	102	47	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloroethane	75-00-3	1	mg/kg	----	10 mg/kg	107	49	143	
		5	mg/kg	<5	----	----	----	----	
EP074: Trichlorofluoromethane	75-69-4	1	mg/kg	----	10 mg/kg	116	49	135	
		5	mg/kg	<5	----	----	----	----	
EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	98.9	54	126	
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	100	43	129	
EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	96.8	62	130	
EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	103	66	132	
EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	97.4	66	132	
EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	104	62	126	
EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	97.0	64	128	
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	107	59	125	
EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	105	65	123	
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	99.6	64	120	
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	103	65	127	
EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	93.0	70	130	
EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	98.2	72	128	
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	97.8	67	143	
EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	93.5	62	122	
EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	92.1	54	128	
EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	91.0	55	129	
EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	95.2	56	132	
EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	100	65	135	
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	93.5	19.8	134	
EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	90.7	53	129	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3217254) - continued</b>									
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	106	48	136	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3217254)</b>									
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	97.0	70	128	
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	92.8	67	127	
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	97.5	64	130	
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	98.7	62	130	
EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	99.8	63	129	
EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	96.6	63	129	
EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	98.1	66	128	
EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	97.5	54	134	
EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	100	60	132	
<b>EP074G: Trihalomethanes (QCLot: 3217254)</b>									
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	105	62	120	
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	103	61	121	
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	98.6	63	121	
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	104	60	126	
<b>EP074H: Naphthalene (QCLot: 3217254)</b>									
EP074: Naphthalene	91-20-3	0.5	mg/kg	----	1 mg/kg	100	63	133	
		5	mg/kg	<5	----	----	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3213843)</b>									
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	107	74	116	
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	106	74	116	
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	97.9	72	116	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	105	69	123	
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	81.4	60.3	117	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	96.2	69	117	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	86.1	68	112	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	92.5	73	117	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	82.7	76.4	114	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	81.9	57	111	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	81.9	68.9	112	
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	23.9	3.9	57	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3213843)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	113	80	124	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	106	77	123	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	113	79	123	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	113	77	123	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	110	79	123	



Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3213843) - continued</b>									
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	110	79	123	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	109	79	123	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	112	79	125	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	101	73	121	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	106	81	123	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	98.1	70	118	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	115	77	123	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	108	76	122	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	110	71	113	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	108	71.7	113	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	103	72.4	114	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3213842)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	95.1	71	131	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	92.1	74	138	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	90.5	64	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3217253)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	77.8	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3213842)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	96.9	70	130	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	89.5	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	
		50	mg/kg	----	150 mg/kg	93.1	63	131	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3217253)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	78.7	68.4	128	
<b>EP080: BTEXN (QCLot: 3217253)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	74.7	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	84.5	62	128	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	81.5	58	118	
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	84.8	60	120	
	106-42-3								
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	86.4	60	120	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	85.9	62	138	

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>ED037P: Alkalinity by PC Titrator (QCLot: 3212263)</b>									
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	----	200 mg/L	88.8	81	111	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3215140)</b>									



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3215140) - continued</b>									
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	108	86	122	
<b>ED045G: Chloride Discrete analyser (QCLot: 3215139)</b>									
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	97.3	77	123	
<b>ED093F: Dissolved Major Cations (QCLot: 3215138)</b>									
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	87	113	
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	97.7	89	113	
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	95.7	79	113	
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	99.1	87	115	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3213228)</b>									
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	98.8	77	115	
<b>EG094T: Total metals in Fresh water by ORC-ICPMS (QCLot: 3223195)</b>									
EG094A-T: Arsenic	7440-38-2	0.2	µg/L	<0.2	10 µg/L	94.5	81	125	
EG094A-T: Boron	7440-42-8	5	µg/L	<5	10 µg/L	93.7	70	130	
EG094A-T: Cadmium	7440-43-9	0.05	µg/L	<0.05	10 µg/L	86.8	77	111	
EG094A-T: Chromium	7440-47-3	0.2	µg/L	<0.2	10 µg/L	90.7	78	126	
EG094A-T: Copper	7440-50-8	0.5	µg/L	<0.5	10 µg/L	85.2	78	126	
EG094A-T: Lead	7439-92-1	0.1	µg/L	<0.1	10 µg/L	93.8	75	123	
EG094A-T: Manganese	7439-96-5	0.5	µg/L	<0.5	10 µg/L	93.6	81	121	
EG094A-T: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	95.6	82	124	
EG094A-T: Zinc	7440-66-6	1	µg/L	<1	10 µg/L	103	75	129	
<b>EG094T: Total metals in Fresh water by ORC-ICPMS (QCLot: 3223196)</b>									
EG094B-T: Selenium	7782-49-2	0.2	µg/L	<0.2	100 µg/L	110	78	124	
<b>EK040P: Fluoride by PC Titrator (QCLot: 3212262)</b>									
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5.0 mg/L	95.2	75	119	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3218288)</b>									
EP074: Styrene	100-42-5	5	µg/L	<5	10 µg/L	96.3	74	118	
EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	10 µg/L	99.5	75	121	
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	10 µg/L	97.1	67	123	
EP074: 1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	10 µg/L	97.5	70	122	
EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	10 µg/L	101	69	123	
EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	10 µg/L	97.8	71	121	
EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	10 µg/L	99.1	70	122	
EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	10 µg/L	100	67	123	
EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	10 µg/L	96.3	62	126	
<b>EP074B: Oxygenated Compounds (QCLot: 3218288)</b>									
EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	100 µg/L	80.5	61.4	134	
EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	100 µg/L	86.6	73.6	130	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	100 µg/L	85.6	61	139	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EP074B: Oxygenated Compounds (QCLot: 3218288) - continued</b>									
EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	100 µg/L	91.0	65	137	
<b>EP074C: Sulfonated Compounds (QCLot: 3218288)</b>									
EP074: Carbon disulfide	75-15-0	5	µg/L	<5	10 µg/L	101	72.8	127	
<b>EP074D: Fumigants (QCLot: 3218288)</b>									
EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	10 µg/L	96.6	61	119	
EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	10 µg/L	97.8	76	120	
EP074: cis-1,3-Dichloropropylene	10061-01-5	10	µg/L	<10	10 µg/L	79.7	62	120	
EP074: trans-1,3-Dichloropropylene	10061-02-6	10	µg/L	<10	10 µg/L	76.0	61	119	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	10 µg/L	95.3	69	117	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3218288)</b>									
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	100 µg/L	72.9	60.6	138	
EP074: Chloromethane	74-87-3	50	µg/L	<50	100 µg/L	82.1	67.4	130	
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	100 µg/L	121	69.4	129	
EP074: Bromomethane	74-83-9	50	µg/L	<50	100 µg/L	87.1	56	140	
EP074: Chloroethane	75-00-3	50	µg/L	<50	100 µg/L	106	63	135	
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	100 µg/L	102	65	131	
EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	10 µg/L	94.8	69	123	
EP074: Iodomethane	74-88-4	5	µg/L	<5	10 µg/L	95.0	70.2	128	
EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	10 µg/L	97.0	71	119	
EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	10 µg/L	102	75	119	
EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	10 µg/L	98.3	77	117	
EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	10 µg/L	104	61	119	
EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	10 µg/L	94.6	73	119	
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	10 µg/L	108	63	121	
EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	10 µg/L	103	78	122	
EP074: Trichloroethene	79-01-6	5	µg/L	<5	10 µg/L	98.0	74	120	
EP074: Dibromomethane	74-95-3	5	µg/L	<5	10 µg/L	102	74	118	
EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	10 µg/L	96.1	75	123	
EP074: 1,3-Dichloropropane	142-28-9	5	µg/L	<5	10 µg/L	98.4	79	121	
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	10 µg/L	97.1	72	124	
EP074: 1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	10 µg/L	99.0	66	114	
EP074: trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	10 µg/L	86.4	60	120	
EP074: cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	10 µg/L	82.1	70.6	128	
EP074: 1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	10 µg/L	94.7	70	124	
EP074: 1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	10 µg/L	97.0	74	128	
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	10 µg/L	97.8	71.8	126	
EP074: 1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	10 µg/L	101	66.4	136	
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	10 µg/L	113	58	132	





Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3218288)</b>									
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	10 µg/L	99.3	80	118	
EP074: Bromobenzene	108-86-1	5	µg/L	<5	10 µg/L	95.1	76	116	
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	10 µg/L	99.4	71	121	
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	10 µg/L	101	71	121	
EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	10 µg/L	98.6	74	120	
EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	10 µg/L	96.1	72	120	
EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	10 µg/L	97.2	77	117	
EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	10 µg/L	98.1	60	126	
EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	10 µg/L	104	67	125	
<b>EP074G: Trihalomethanes (QCLot: 3218288)</b>									
EP074: Chloroform	67-66-3	5	µg/L	<5	10 µg/L	104	76	118	
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	10 µg/L	106	64	118	
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	10 µg/L	104	65	115	
EP074: Bromoform	75-25-2	5	µg/L	<5	10 µg/L	110	73.5	126	
<b>EP074H: Naphthalene (QCLot: 3218288)</b>									
EP074: Naphthalene	91-20-3	7	µg/L	<7	10 µg/L	101	61	125	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3213904)</b>									
EP075(SIM): Phenol	108-95-2	0.2	µg/L	----	5 µg/L	39.8	24.5	61.9	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Chlorophenol	95-57-8	0.2	µg/L	----	5 µg/L	66.4	63.8	110	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Methylphenol	95-48-7	0.2	µg/L	----	5 µg/L	70.7	55.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	0.4	µg/L	----	10 µg/L	59.7	42.5	114	
		2	µg/L	<2.0	----	----	----	----	
EP075(SIM): 2-Nitrophenol	88-75-5	0.2	µg/L	----	5 µg/L	84.8	62.7	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.2	µg/L	----	5 µg/L	86.0	59.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.2	µg/L	----	5 µg/L	82.2	59.3	122	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.2	µg/L	----	5 µg/L	89.5	64.3	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.2	µg/L	----	5 µg/L	85.9	63	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.2	µg/L	----	5 µg/L	73.8	58.7	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.2	µg/L	----	5 µg/L	79.6	50	108	
		1	µg/L	<1.0	----	----	----	----	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3213904) - continued</b>									
EP075(SIM): Pentachlorophenol	87-86-5	0.4	µg/L	----	10 µg/L	76.8	8.7	95	
		2	µg/L	<2.0	----	----	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3213904)</b>									
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	5 µg/L	88.2	58.6	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	5 µg/L	76.9	63.6	114	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	5 µg/L	72.5	62.2	113	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	5 µg/L	82.7	63.9	115	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	5 µg/L	84.6	62.6	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	5 µg/L	88.8	64.3	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	5 µg/L	94.4	63.6	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	5 µg/L	90.3	63.1	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	5 µg/L	74.1	64.1	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	5 µg/L	80.1	62.5	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	5 µg/L	73.5	61.7	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	5 µg/L	84.5	61.7	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	5 µg/L	75.1	63.3	117	
		0.5	µg/L	<0.5	----	----	----	----	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	5 µg/L	77.5	59.9	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	----	5 µg/L	75.8	61.2	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	----	5 µg/L	79.7	59.1	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	1	µg/L	<1.0	----	----	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3213903)</b>									
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	88.3	59	129	
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	98.6	71	131	
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	102	62	120	



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3218289)</b>									
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	100	75	127	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3213903)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	2500 µg/L	91.4	58.9	131	
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	101	73.9	138	
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----	
		50	µg/L	----	1500 µg/L	104	67	127	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3218289)</b>									
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	101	75	127	
<b>EP080: BTEXN (QCLot: 3218289)</b>									
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	99.8	70	124	
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	99.0	65	129	
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	89.0	70	120	
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	89.7	69	121	
	106-42-3								
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	92.4	72	122	
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	90.4	70	124	

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%) MS	Recovery Limits (%)	
						Low	High
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3220316)</b>							
ES1327282-002	MA_SS01_S	EG035T-LL: Mercury	7439-97-6	0.050 mg/kg	103	70	130
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3217254)</b>							
ES1327178-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	75.3	70	130
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	73.6	70	130
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3217254)</b>							
ES1327178-001	Anonymous	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	88.8	70	130
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3213843)</b>							
ES1327368-001	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	111	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	110	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	67.6	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	90.8	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	40.0	20	130



Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3213843)</b>							
ES1327368-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	108	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	115	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3213842)</b>							
ES1327368-001	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	89.6	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	90.8	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	78.2	52	132
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3217253)</b>							
ES1327178-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	77.1	70	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3213842)</b>							
ES1327368-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	112	73	137
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	83.2	53	131
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	60.2	52	132
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3217253)</b>							
ES1327178-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	76.3	70	130
<b>EP080: BTEXN (QCLot: 3217253)</b>							
ES1327178-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	76.7	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	74.0	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	77.4	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	77.9	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	83.6	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	84.0	70	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3215140)</b>							
ES1327282-001	MA_SS01_W	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130
<b>ED045G: Chloride Discrete analyser (QCLot: 3215139)</b>							
ES1327282-001	MA_SS01_W	ED045G: Chloride	16887-00-6	250 mg/L	90.9	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3213228)</b>							
ES1327118-001	Anonymous	EG035T: Mercury	7439-97-6	0.010 mg/L	73.1	70	130
<b>EK040P: Fluoride by PC Titrator (QCLot: 3212262)</b>							
ES1327281-002	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	99.6	70	130
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3218288)</b>							



Sub-Matrix: WATER

				Matrix Spike (MS) Report				
				Spike	SpikeRecovery(%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3218288) - continued</b>								
ES1327317-002	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	25 µg/L	100	70	130	
		EP074: Trichloroethene	79-01-6	25 µg/L	106	70	130	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3218288)</b>								
ES1327317-002	Anonymous	EP074: Chlorobenzene	108-90-7	25 µg/L	110	70	130	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3213904)</b>								
ES1327431-002	Anonymous	EP075(SIM): Phenol	108-95-2	20 µg/L	39.4	20	130	
		EP075(SIM): 2-Chlorophenol	95-57-8	20 µg/L	76.3	60	130	
		EP075(SIM): 2-Nitrophenol	88-75-5	20 µg/L	75.2	60	130	
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	20 µg/L	81.3	70	130	
		EP075(SIM): Pentachlorophenol	87-86-5	20 µg/L	85.4	20	130	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3213904)</b>								
ES1327431-002	Anonymous	EP075(SIM): Acenaphthene	83-32-9	20 µg/L	79.5	70	130	
		EP075(SIM): Pyrene	129-00-0	20 µg/L	83.8	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3213903)</b>								
ES1327431-002	Anonymous	EP071: C10 - C14 Fraction	----	200 µg/L	102	74	150	
		EP071: C15 - C28 Fraction	----	300 µg/L	95.0	77	153	
		EP071: C29 - C36 Fraction	----	200 µg/L	106	67	153	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3218289)</b>								
ES1327317-002	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	120	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3213903)</b>								
ES1327431-002	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	250 µg/L	99.2	74	150	
		EP071: >C16 - C34 Fraction	----	350 µg/L	95.2	77	153	
		EP071: >C34 - C40 Fraction	----	150 µg/L	95.6	67	153	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3218289)</b>								
ES1327317-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	120	70	130	
<b>EP080: BTEXN (QCLot: 3218289)</b>								
ES1327317-002	Anonymous	EP080: Benzene	71-43-2	25 µg/L	96.5	70	130	
		EP080: Toluene	108-88-3	25 µg/L	98.3	70	130	
		EP080: Ethylbenzene	100-41-4	25 µg/L	100	70	130	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	100	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	25 µg/L	102	70	130	
EP080: Naphthalene	91-20-3	25 µg/L	102	70	130			

**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report**



The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
					MS	MSD	Low	High	Value	Control Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3213842)</b>											
ES1327368-001	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	89.6	----	73	137	----	----	
		EP071: C15 - C28 Fraction	----	3140 mg/kg	90.8	----	53	131	----	----	
		EP071: C29 - C36 Fraction	----	2860 mg/kg	78.2	----	52	132	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3213842)</b>											
ES1327368-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	112	----	73	137	----	----	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	83.2	----	53	131	----	----	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	60.2	----	52	132	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3213843)</b>											
ES1327368-001	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	111	----	70	130	----	----	
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	110	----	70	130	----	----	
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	67.6	----	60	130	----	----	
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	90.8	----	70	130	----	----	
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	40.0	----	20	130	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3213843)</b>											
ES1327368-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	108	----	70	130	----	----	
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	115	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3217253)</b>											
ES1327178-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	77.1	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3217253)</b>											
ES1327178-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	76.3	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3217253)</b>											
ES1327178-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	76.7	----	70	130	----	----	
		EP080: Toluene	108-88-3	2.5 mg/kg	74.0	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	77.4	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	77.9	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	83.6	----	70	130	----	----	
	91-20-3	2.5 mg/kg	84.0	----	70	130	----	----			
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3217254)</b>											
ES1327178-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	75.3	----	70	130	----	----	
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	73.6	----	70	130	----	----	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3217254)</b>											
ES1327178-001	Anonymous	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	88.8	----	70	130	----	----	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3220316)</b>											
ES1327282-002	MA_SS01_S	EG035T-LL: Mercury	7439-97-6	0.050 mg/kg	103	----	70	130	----	----	





Sub-Matrix: **WATER**

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>EK040P: Fluoride by PC Titrator (QCLot: 3212262)</b>										
ES1327281-002	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	99.6	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3213228)</b>										
ES1327118-001	Anonymous	EG035T: Mercury	7439-97-6	0.010 mg/L	73.1	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3213903)</b>										
ES1327431-002	Anonymous	EP071: C10 - C14 Fraction	----	200 µg/L	102	----	74	150	----	----
		EP071: C15 - C28 Fraction	----	300 µg/L	95.0	----	77	153	----	----
		EP071: C29 - C36 Fraction	----	200 µg/L	106	----	67	153	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3213903)</b>										
ES1327431-002	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	250 µg/L	99.2	----	74	150	----	----
		EP071: >C16 - C34 Fraction	----	350 µg/L	95.2	----	77	153	----	----
		EP071: >C34 - C40 Fraction	----	150 µg/L	95.6	----	67	153	----	----
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3213904)</b>										
ES1327431-002	Anonymous	EP075(SIM): Phenol	108-95-2	20 µg/L	39.4	----	20	130	----	----
		EP075(SIM): 2-Chlorophenol	95-57-8	20 µg/L	76.3	----	60	130	----	----
		EP075(SIM): 2-Nitrophenol	88-75-5	20 µg/L	75.2	----	60	130	----	----
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	20 µg/L	81.3	----	70	130	----	----
		EP075(SIM): Pentachlorophenol	87-86-5	20 µg/L	85.4	----	20	130	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3213904)</b>										
ES1327431-002	Anonymous	EP075(SIM): Acenaphthene	83-32-9	20 µg/L	79.5	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	20 µg/L	83.8	----	70	130	----	----
<b>ED045G: Chloride Discrete analyser (QCLot: 3215139)</b>										
ES1327282-001	MA_SS01_W	ED045G: Chloride	16887-00-6	250 mg/L	90.9	----	70	130	----	----
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3215140)</b>										
ES1327282-001	MA_SS01_W	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	----	70	130	----	----
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3218288)</b>										
ES1327317-002	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	25 µg/L	100	----	70	130	----	----
		EP074: Trichloroethene	79-01-6	25 µg/L	106	----	70	130	----	----
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3218288)</b>										
ES1327317-002	Anonymous	EP074: Chlorobenzene	108-90-7	25 µg/L	110	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3218289)</b>										
ES1327317-002	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	120	----	70	130	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3218289)</b>										
ES1327317-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	120	----	70	130	----	----
<b>EP080: BTEXN (QCLot: 3218289)</b>										
ES1327317-002	Anonymous	EP080: Benzene	71-43-2	25 µg/L	96.5	----	70	130	----	----
		EP080: Toluene	108-88-3	25 µg/L	98.3	----	70	130	----	----

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Sub-Matrix: WATER

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
				Concentration	MS	MSD	Low	High	Value	Control Limit
<b>EP080: BTEXN (QCLot: 3218289) - continued</b>										
ES1327317-002	Anonymous	EP080: Ethylbenzene	100-41-4	25 µg/L	100	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	100	----	70	130	----	----
		EP080: ortho-Xylene	95-47-6	25 µg/L	102	----	70	130	----	----
		EP080: Naphthalene	91-20-3	25 µg/L	102	----	70	130	----	----

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1327282</b>	Page	: 1 of 12
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: SYMPHONY - DELTA WEST	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 13-DEC-2013
C-O-C number	: ----	Issue Date	: 23-DEC-2013
Sampler	: AA	No. of samples received	: 2
Order number	: 0207420/0207423	No. of samples analysed	: 2
Quote number	: SY/551/13 V4		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EA055: Moisture Content</b>							
Soil Glass Jar - Unpreserved (EA055-103) MA_SS01_S	12-DEC-2013	----	----	----	19-DEC-2013	26-DEC-2013	✓
<b>EG020-SD: Total Metals in Sediments by ICPMS</b>							
Soil Glass Jar - Unpreserved (EG020-SD) MA_SS01_S	12-DEC-2013	19-DEC-2013	10-JUN-2014	✓	20-DEC-2013	10-JUN-2014	✓
<b>EG020T: Total Metals by ICP-MS</b>							
Soil Glass Jar - Unpreserved (EG020T) MA_SS01_S	12-DEC-2013	19-DEC-2013	10-JUN-2014	✓	20-DEC-2013	10-JUN-2014	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>							
Soil Glass Jar - Unpreserved (EG035T-LL) MA_SS01_S	12-DEC-2013	19-DEC-2013	09-JAN-2014	✓	19-DEC-2013	09-JAN-2014	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>							
Soil Glass Jar - Unpreserved (EP071) MA_SS01_S	12-DEC-2013	16-DEC-2013	26-DEC-2013	✓	16-DEC-2013	25-JAN-2014	✓
<b>EP074D: Fumigants</b>							
Soil Glass Jar - Unpreserved (EP074) MA_SS01_S	12-DEC-2013	17-DEC-2013	19-DEC-2013	✓	19-DEC-2013	19-DEC-2013	✓
<b>EP074E: Halogenated Aliphatic Compounds</b>							
Soil Glass Jar - Unpreserved (EP074) MA_SS01_S	12-DEC-2013	17-DEC-2013	19-DEC-2013	✓	19-DEC-2013	19-DEC-2013	✓
<b>EP074F: Halogenated Aromatic Compounds</b>							
Soil Glass Jar - Unpreserved (EP074) MA_SS01_S	12-DEC-2013	17-DEC-2013	19-DEC-2013	✓	19-DEC-2013	19-DEC-2013	✓
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>							
Soil Glass Jar - Unpreserved (EP074) MA_SS01_S	12-DEC-2013	17-DEC-2013	19-DEC-2013	✓	19-DEC-2013	19-DEC-2013	✓
<b>EP074H: Naphthalene</b>							
Soil Glass Jar - Unpreserved (EP074) MA_SS01_S	12-DEC-2013	17-DEC-2013	19-DEC-2013	✓	19-DEC-2013	19-DEC-2013	✓
<b>EP074B: Oxygenated Compounds</b>							
Soil Glass Jar - Unpreserved (EP074) MA_SS01_S	12-DEC-2013	17-DEC-2013	19-DEC-2013	✓	19-DEC-2013	19-DEC-2013	✓



Matrix: **SOIL** Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP074C: Sulfonated Compounds</b>							
Soil Glass Jar - Unpreserved (EP074) MA_SS01_S	12-DEC-2013	17-DEC-2013	19-DEC-2013	✓	19-DEC-2013	19-DEC-2013	✓
<b>EP074G: Trihalomethanes</b>							
Soil Glass Jar - Unpreserved (EP074) MA_SS01_S	12-DEC-2013	17-DEC-2013	19-DEC-2013	✓	19-DEC-2013	19-DEC-2013	✓
<b>EP075(SIM)A: Phenolic Compounds</b>							
Soil Glass Jar - Unpreserved (EP075(SIM)) MA_SS01_S	12-DEC-2013	16-DEC-2013	26-DEC-2013	✓	17-DEC-2013	25-JAN-2014	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>							
Soil Glass Jar - Unpreserved (EP075(SIM)) MA_SS01_S	12-DEC-2013	16-DEC-2013	26-DEC-2013	✓	17-DEC-2013	25-JAN-2014	✓
<b>EP080: BTEXN</b>							
Soil Glass Jar - Unpreserved (EP080) MA_SS01_S	12-DEC-2013	17-DEC-2013	26-DEC-2013	✓	19-DEC-2013	26-DEC-2013	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>							
Soil Glass Jar - Unpreserved (EP080) MA_SS01_S	12-DEC-2013	17-DEC-2013	26-DEC-2013	✓	19-DEC-2013	26-DEC-2013	✓

Matrix: **WATER** Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>ED037P: Alkalinity by PC Titrator</b>							
Clear Plastic Bottle - Natural (ED037-P) MA_SS01_W	12-DEC-2013	---	26-DEC-2013	----	16-DEC-2013	26-DEC-2013	✓
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>							
Clear Plastic Bottle - Natural (ED041G) MA_SS01_W	12-DEC-2013	---	09-JAN-2014	----	16-DEC-2013	09-JAN-2014	✓
<b>ED045G: Chloride Discrete analyser</b>							
Clear Plastic Bottle - Natural (ED045G) MA_SS01_W	12-DEC-2013	---	09-JAN-2014	----	16-DEC-2013	09-JAN-2014	✓
<b>ED093F: Dissolved Major Cations</b>							
Clear Plastic Bottle - Natural (ED093F) MA_SS01_W	12-DEC-2013	---	19-DEC-2013	----	16-DEC-2013	19-DEC-2013	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG035T) MA_SS01_W	12-DEC-2013	----	----	----	16-DEC-2013	09-JAN-2014	✓
<b>EG094T: Total metals in Fresh water by ORC-ICPMS</b>							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG094A-T) MA_SS01_W	12-DEC-2013	20-DEC-2013	10-JUN-2014	✓	20-DEC-2013	10-JUN-2014	✓



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EG094T: Total metals in Fresh water by ORC-ICPMS</b>							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG094B-T) MA_SS01_W	12-DEC-2013	20-DEC-2013	10-JUN-2014	✓	20-DEC-2013	10-JUN-2014	✓
<b>EK040P: Fluoride by PC Titrator</b>							
Clear Plastic Bottle - Natural (EK040P) MA_SS01_W	12-DEC-2013	---	09-JAN-2014	----	16-DEC-2013	09-JAN-2014	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>							
Amber Glass Bottle - Unpreserved (EP071) MA_SS01_W	12-DEC-2013	16-DEC-2013	19-DEC-2013	✓	17-DEC-2013	25-JAN-2014	✓
<b>EP074D: Fumigants</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MA_SS01_W	12-DEC-2013	19-DEC-2013	26-DEC-2013	✓	19-DEC-2013	26-DEC-2013	✓
<b>EP074E: Halogenated Aliphatic Compounds</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MA_SS01_W	12-DEC-2013	19-DEC-2013	26-DEC-2013	✓	19-DEC-2013	26-DEC-2013	✓
<b>EP074F: Halogenated Aromatic Compounds</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MA_SS01_W	12-DEC-2013	19-DEC-2013	26-DEC-2013	✓	19-DEC-2013	26-DEC-2013	✓
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MA_SS01_W	12-DEC-2013	19-DEC-2013	26-DEC-2013	✓	19-DEC-2013	26-DEC-2013	✓
<b>EP074H: Naphthalene</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MA_SS01_W	12-DEC-2013	19-DEC-2013	26-DEC-2013	✓	19-DEC-2013	26-DEC-2013	✓
<b>EP074B: Oxygenated Compounds</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MA_SS01_W	12-DEC-2013	19-DEC-2013	26-DEC-2013	✓	19-DEC-2013	26-DEC-2013	✓
<b>EP074C: Sulfonated Compounds</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MA_SS01_W	12-DEC-2013	19-DEC-2013	26-DEC-2013	✓	19-DEC-2013	26-DEC-2013	✓
<b>EP074G: Trihalomethanes</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MA_SS01_W	12-DEC-2013	19-DEC-2013	26-DEC-2013	✓	19-DEC-2013	26-DEC-2013	✓
<b>EP075(SIM)A: Phenolic Compounds</b>							
Amber Glass Bottle - Unpreserved (EP075(SIM)) MA_SS01_W	12-DEC-2013	16-DEC-2013	19-DEC-2013	✓	17-DEC-2013	25-JAN-2014	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>							
Amber Glass Bottle - Unpreserved (EP075(SIM)) MA_SS01_W	12-DEC-2013	16-DEC-2013	19-DEC-2013	✓	17-DEC-2013	25-JAN-2014	✓
<b>EP080: BTEXN</b>							
Amber VOC Vial - Sulfuric Acid (EP080) MA_SS01_W	12-DEC-2013	19-DEC-2013	26-DEC-2013	✓	19-DEC-2013	26-DEC-2013	✓



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 Project : SYMPHONY - DELTA WEST



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP080/071: Total Petroleum Hydrocarbons</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MA_SS01_W	12-DEC-2013	19-DEC-2013	26-DEC-2013	✓	19-DEC-2013	26-DEC-2013	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
<b>Laboratory Duplicates (DUP)</b>							
Moisture Content	EA055-103	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	17	11.8	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS (Low Level)	EG035T-LL	1	1	100.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals in Sediments by ICPMS	EG020-SD	1	1	100.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	17	11.8	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	7	14.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	7	14.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
Total Metals by ICP-MS	EG020T	1	1	100.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS (Low Level)	EG035T-LL	1	1	100.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals in Sediments by ICPMS	EG020-SD	1	1	100.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	7	14.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	7	14.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
Total Metals by ICP-MS	EG020T	1	1	100.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS (Low Level)	EG035T-LL	1	1	100.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals in Sediments by ICPMS	EG020-SD	1	1	100.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	7	14.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	7	14.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS (Low Level)	EG035T-LL	1	1	100.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	7	14.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	7	14.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
<b>Laboratory Duplicates (DUP)</b>							
Alkalinity by PC Titrator	ED037-P	2	16	12.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



Matrix: **WATER** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP) - Continued</b>							
Fluoride by PC Titrator	EK040P	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	17	11.8	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-T	1	2	50.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-T	1	3	33.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
Alkalinity by PC Titrator	ED037-P	1	16	6.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-T	1	2	50.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-T	1	3	33.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
Chloride by Discrete Analyser	ED045G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-T	1	2	50.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-T	1	3	33.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
Chloride by Discrete Analyser	ED045G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



Matrix: **WATER** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Matrix Spikes (MS) - Continued</b>							
Total Mercury by FIMS	EG035T	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals in Sediments by ICPMS	EG020-SD	SOIL	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector. Analyte list and LORs per NODG.
Total Metals by ICP-MS	EG020T	SOIL	(APHA 21st ed., 3125; USEPA SW846 - 6020) (ICPMS) Metals in solids are determined following an appropriate acid digestion. The ICPMS technique ionizes selected elements. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass / charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS (Low Level)	EG035T-LL	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (2013) Schedule B(3) (Method 506.1)
Volatile Organic Compounds	EP074	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Sulfate (Turbidimetric) as SO <sub>4</sub> <sup>2-</sup> by Discrete Analyser	ED041G	WATER	APHA 21st ed., 4500-SO <sub>4</sub> Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> <sup>2-</sup> concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Chloride by Discrete Analyser	ED045G	WATER	APHA 21st ed., 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2017-1-L april 2003



Analytical Methods	Method	Matrix	Method Descriptions
Major Cations - Dissolved	ED093F	WATER	<p>Major Cations is determined based on APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um filtered sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)</p> <p>Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)</p> <p>Hardness parameters are calculated based on APHA 21st ed., 2340 B. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)</p>
Total Mercury by FIMS	EG035T	WATER	<p>AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl<sub>2</sub>)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl<sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)</p>
Total Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-T	WATER	<p>APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)</p>
Total Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-T	WATER	<p>APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)</p>
Fluoride by PC Titrator	EK040P	WATER	<p>APHA 21st ed., 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)</p>
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	<p>APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by Turbi SO<sub>4</sub> by DA. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)</p>
TPH - Semivolatle Fraction	EP071	WATER	<p>USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)</p>
Volatile Organic Compounds	EP074	WATER	<p>USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)</p>
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	<p>USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)</p>





Analytical Methods	Method	Matrix	Method Descriptions
TPH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Preparation Methods	Method	Matrix	Method Descriptions
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of distilled water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.
Digestion for Total Recoverable Metals - ORC	EN25-ORC	WATER	Modified USEPA SW846-3005. This is an Ultrapure Nitric acid digestion procedure used to prepare surface and ground water samples for analysis by ORC- ICPMS. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Lab Acidification of Metals	EN80	WATER	USEPA Method 200.8
Separatory Funnel Extraction of Liquids	ORG14	WATER	USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.



## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Matrix Spike (MS) Recoveries</b>							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	ES1327282-001	MA_SS01_W	Sulfate as SO4 - Turbidimetric	14808-79-8	Not Determined	----	<b>MS recovery not determined, background level greater than or equal to 4x spike level.</b>

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.

#### Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- No Analysis Holding Time Outliers exist.

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

**Work Order** : **ES1327282**

**Client** : **ENVIRO RESOURCES MANAGEMENT**      **Laboratory** : Environmental Division Sydney

**Contact** : MR JONATHAN LEKAWSKI      **Contact** : Barbara Hanna  
**Address** : GROUND FLOOR      **Address** : 277-289 Woodpark Road Smithfield  
33 SAUNDERS STREET, PYRMONT      NSW Australia 2164  
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LOCKED BAG 24  
BROADWAY NSW, AUSTRALIA 2007

**E-mail** : jonathan.lekawski@erm.com      **E-mail** : Barbara.Hanna@alsglobal.com  
**Telephone** : +61 02 8584 8888      **Telephone** : +61 2 8784 8555  
**Facsimile** : +61 02 8584 8800      **Facsimile** : +61 2 8784 8555

**Project** : SYMPHONY - DELTA WEST      **Page** : 1 of 3  
**Order number** : 0207420/0207423  
**C-O-C number** : ----      **Quote number** : ES2013ENVRES0360 (SY/551/13 V4)  
**Site** : ----  
**Sampler** : AA      **QC Level** : NEPM 2013 Schedule B(3) and ALS QCS3 requirement

### Dates

**Date Samples Received** : 13-DEC-2013      **Issue Date** : 13-DEC-2013 17:34  
**Client Requested Due Date** : 20-DEC-2013      **Scheduled Reporting Date** : **20-DEC-2013**

### Delivery Details

**Mode of Delivery** : Carrier      **Temperature** : 10.8°C  
**No. of coolers/boxes** : 5 HARD      **No. of samples received** : 2  
**Security Seal** : Intact.      **No. of samples analysed** : 2

### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



### Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

### Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EG020-SD Total Metals in Sediments by ICPMS (NODG)	SOIL - EG020T Total Metals by ICPMS	SOIL - EG035-SD Mercury in Sediments by FIMS (NODG-required)	SOIL - EP074 (solids) Volatile Organic Compounds	SOIL - S-24 TRH/BTEX/NPAH + Phenols
ES1327282-002	12-DEC-2013 15:00	MA_SS01_S	✓	✓	✓	✓	✓

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EG035T Total Mercury by FIMS	WATER - EG093A-T Total metals in Saline Water Suite A by ORC-ICPMS	WATER - EG093B-T Total Metals in Saline Water -Suite B by	WATER - EK040-P Fluoride(PC)	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP074 (water) Volatile Organic Compounds	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
ES1327282-001	12-DEC-2013 15:00	MA_SS01_W	✓	✓	✓	✓	✓	✓	✓	✓

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - W-24 TRH/BTEX/NPAH/Phenols
ES1327282-001	12-DEC-2013 15:00	MA_SS01_W	✓



## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

### Requested Deliverables

#### ALL INVOICES

- A4 - AU Tax Invoice ( INV ) Email au.accounts@erm.com

#### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA ) Email jonathan.lekawski@erm.com  
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI ) Email jonathan.lekawski@erm.com  
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC ) Email jonathan.lekawski@erm.com  
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN ) Email jonathan.lekawski@erm.com  
- Chain of Custody (CoC) ( COC ) Email jonathan.lekawski@erm.com  
- EDI Format - ENMRG ( ENMRG ) Email jonathan.lekawski@erm.com  
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM ) Email jonathan.lekawski@erm.com  
- EDI Format - ESDAT ( ESDAT ) Email jonathan.lekawski@erm.com  
- EDI Format - XTab ( XTAB ) Email jonathan.lekawski@erm.com

#### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA ) Email symphony.deltawest@erm.com  
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI ) Email symphony.deltawest@erm.com  
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC ) Email symphony.deltawest@erm.com  
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN ) Email symphony.deltawest@erm.com  
- A4 - AU Tax Invoice ( INV ) Email symphony.deltawest@erm.com  
- Chain of Custody (CoC) ( COC ) Email symphony.deltawest@erm.com  
- EDI Format - ENMRG ( ENMRG ) Email symphony.deltawest@erm.com  
- EDI Format - ESDAT ( ESDAT ) Email symphony.deltawest@erm.com  
- EDI Format - XTab ( XTAB ) Email symphony.deltawest@erm.com

#### SYMPHONY ERARING

- \*AU Certificate of Analysis - NATA ( COA ) Email Symphony.Eraring@erm.com  
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI ) Email Symphony.Eraring@erm.com  
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC ) Email Symphony.Eraring@erm.com  
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN ) Email Symphony.Eraring@erm.com  
- A4 - AU Tax Invoice ( INV ) Email Symphony.Eraring@erm.com  
- Chain of Custody (CoC) ( COC ) Email Symphony.Eraring@erm.com  
- EDI Format - ENMRG ( ENMRG ) Email Symphony.Eraring@erm.com  
- EDI Format - ESDAT ( ESDAT ) Email Symphony.Eraring@erm.com  
- EDI Format - XTab ( XTAB ) Email Symphony.Eraring@erm.com

#### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV ) Email au.accounts@erm.com



# CHAIN OF CUSTODY

ALS Laboratory  
please tick →

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**CLIENT:** ERM

**OFFICE:** GROUND FLOOR, 33 SAUNDERS ST, PYRMONT NSW 2009

**PROJECT:** Symphony - Delta West

**ORDER NUMBER:** 0207420/0207423

**TURNAROUND REQUIREMENTS:**  Standard TAT (List due date);  Non Standard or urgent TAT (List due date):

**ALS QUOTE NO.:** SY65113 VA

**PROJECT MANAGER:** Jonathan Lelawski **CONTACT PH:** 8584 8888

**SAMPLER:** *John Blawie* **SAMPLER MOBILE:**

**COC emailed to ALS? (YES / NO)**

**EDD FORMAT (or default):** ESDAT(PDF)XLS

**Email Reports to (will default to PM if no other addresses are listed):** Symphony.DeltaWest@erm.com

**Email Invoice to (will default to PM if no other addresses are listed):** Symphony.DeltaWest@erm.com

**FOR LABORATORY USE ONLY (Criteria)**

Classy Seal (tick)	Yes	No	N/A
Filters / Fritted Cartridges present upon receipt	Yes	No	N/A
Random Sample - Temperature of Receipt			
Other comment			

**RECEIVED BY:** *David* **DATE/TIME:** *13/12 0830*

**RELINQUISHED BY:** *A. Blawie* **DATE/TIME:** *12/12/13*

**COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:**

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below	TOTAL CONTAINERS (refer to)	ANALYSIS REQUIRED INCLUDING SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).										Additional Information
						W-4 (TPH/TRH) (CS)	8 Ultra Trace Metals (As, Cd, Cr, Cu, Hg, Pb, Zn, Hg)	Additional Metals Ultra Trace - Se, B, FI, Mn	Ferrous Iron	PAH/Phenols	VOC Scan	PCB	Carbons/Arsenics	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.		
1	MA-SS01-W	12/12/13	W		1	X	X	X	X	X	X	X	X	X	X	
2	MA-SS01-S	12/12/13	S		1	X	X	X	X	X	X	X	X	X	X	

Environmental Division  
Sydney  
Work Order  
**ES1327282**



Telephone : +61-2-8784 8555

**Water Container Codes:** P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic  
**V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulfate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved; Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Specimen bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;**  
**Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Solids; B = Unpreserved Bag**



## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>ES1327569</b> <b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : MR JONATHAN LEKAWSKI <b>Address</b> : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007  <b>E-mail</b> : jonathan.lekawski@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800 <b>Project</b> : SYMPHONY - DELTA WEST <b>Order number</b> : 0207420/0207423 <b>C-O-C number</b> : ---- <b>Sampler</b> : CHRIS FORD <b>Site</b> : ----  <b>Quote number</b> : SY/551/13 V4	<b>Page</b> : 1 of 8  <b>Laboratory</b> : Environmental Division Sydney <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164  <b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555 <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement  <b>Date Samples Received</b> : 17-DEC-2013 <b>Issue Date</b> : 02-JAN-2014  <b>No. of samples received</b> : 7 <b>No. of samples analysed</b> : 7
--	---

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits



NATA Accredited Laboratory 825  
 Accredited for compliance with  
 ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Organics



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### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EN055: Ionic balance invalidated for sample 4 due to valid alkalinity result required.**



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MF_MW04	MH_MW02	MF_MW05	D01_161213CF	RB01_161213CF
				16-DEC-2013 17:08	16-DEC-2013 15:23	16-DEC-2013 11:12	16-DEC-2013 15:00	16-DEC-2013 15:00
Compound	CAS Number	LOR	Unit	ES1327569-001	ES1327569-002	ES1327569-003	ES1327569-004	ES1327569-005
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	35	87	241	----	----
Total Alkalinity as CaCO3	----	1	mg/L	35	87	241	----	----
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	46	18	74	19	----
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	29	14	37	10	----
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	14	22	63	22	----
Magnesium	7439-95-4	1	mg/L	10	11	23	11	----
Sodium	7440-23-5	1	mg/L	24	14	52	13	----
Potassium	7440-09-7	1	mg/L	5	10	14	9	----
<b>EG020F: Dissolved Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	----	----	----	----	<0.001
Cadmium	7440-43-9	0.0001	mg/L	----	----	----	----	<0.0001
Chromium	7440-47-3	0.001	mg/L	----	----	----	----	<0.001
Copper	7440-50-8	0.001	mg/L	----	----	----	----	<0.001
Lead	7439-92-1	0.001	mg/L	----	----	----	----	<0.001
Nickel	7440-02-0	0.001	mg/L	----	----	----	----	<0.001
Zinc	7440-66-6	0.005	mg/L	----	----	----	----	<0.005
<b>EG035F: Dissolved Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
<b>EG051G: Ferrous Iron by Discrete Analyser</b>								
Ferrous Iron	----	0.05	mg/L	3.98	2.50	<0.05	2.53	----
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS</b>								
Selenium	7782-49-2	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	----
Arsenic	7440-38-2	0.2	µg/L	1.3	0.7	1.0	0.7	----
Boron	7440-42-8	5	µg/L	31	39	41	33	----
Cadmium	7440-43-9	0.05	µg/L	<0.05	<0.05	0.07	<0.05	----
Chromium	7440-47-3	0.2	µg/L	<0.2	<0.2	<0.2	0.3	----
Copper	7440-50-8	0.5	µg/L	3.6	<0.5	1.9	<0.5	----
Lead	7439-92-1	0.1	µg/L	0.6	0.1	1.3	0.2	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MF_MW04	MH_MW02	MF_MW05	D01_161213CF	RB01_161213CF
				16-DEC-2013 17:08	16-DEC-2013 15:23	16-DEC-2013 11:12	16-DEC-2013 15:00	16-DEC-2013 15:00
Compound	CAS Number	LOR	Unit	ES1327569-001	ES1327569-002	ES1327569-003	ES1327569-004	ES1327569-005
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS - Continued</b>								
Manganese	7439-96-5	0.5	µg/L	947	354	825	321	----
Nickel	7440-02-0	0.5	µg/L	53.0	31.4	34.9	32.2	----
Zinc	7440-66-6	1	µg/L	64	57	102	58	----
<b>EK040P: Fluoride by PC Titrator</b>								
Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.2	----	----
<b>EN055: Ionic Balance</b>								
Total Anions	----	0.01	meq/L	2.48	2.51	7.40	----	----
Total Cations	----	0.01	meq/L	2.69	2.87	7.66	----	----
Ionic Balance	----	0.01	%	----	----	1.71	----	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	1.0	<1.0	<1.0
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MF_MW04	MH_MW02	MF_MW05	D01_161213CF	RB01_161213CF
				16-DEC-2013 17:08	16-DEC-2013 15:23	16-DEC-2013 11:12	16-DEC-2013 15:00	16-DEC-2013 15:00
Compound	CAS Number	LOR	Unit	ES1327569-001	ES1327569-002	ES1327569-003	ES1327569-004	ES1327569-005
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	1.0	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5

### EP075(SIM)S: Phenolic Compound Surrogates



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				MF_MW04	MH_MW02	MF_MW05	D01_161213CF	RB01_161213CF
				16-DEC-2013 17:08	16-DEC-2013 15:23	16-DEC-2013 11:12	16-DEC-2013 15:00	16-DEC-2013 15:00
				ES1327569-001	ES1327569-002	ES1327569-003	ES1327569-004	ES1327569-005
Compound	CAS Number	LOR	Unit					
<b>EP075(SIM)S: Phenolic Compound Surrogates - Continued</b>								
Phenol-d6	13127-88-3	0.1	%	32.3	44.0	34.0	35.0	50.8
2-Chlorophenol-D4	93951-73-6	0.1	%	69.4	93.2	65.6	76.0	93.9
2,4,6-Tribromophenol	118-79-6	0.1	%	79.3	96.6	77.8	86.6	99.3
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	79.6	90.9	69.1	70.9	74.2
Anthracene-d10	1719-06-8	0.1	%	73.8	88.3	70.3	79.1	91.3
4-Terphenyl-d14	1718-51-0	0.1	%	74.0	88.1	73.0	81.1	93.0
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	96.7	96.0	96.1	98.9	92.4
Toluene-D8	2037-26-5	0.1	%	87.5	84.8	82.6	103	83.5
4-Bromofluorobenzene	460-00-4	0.1	%	95.4	92.8	91.0	107	97.8





## Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Client sample ID

				TS	TB	---	---	---
				16-DEC-2013 15:00	16-DEC-2013 15:00	---	---	---
				ES1327569-006	ES1327569-007	---	---	---
Compound	CAS Number	LOR	Unit					
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	---	20	µg/L	---	<20	---	---	---
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	20	µg/L	---	<20	---	---	---
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	---	<20	---	---	---
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	16	<1	---	---	---
Toluene	108-88-3	2	µg/L	16	<2	---	---	---
Ethylbenzene	100-41-4	2	µg/L	16	<2	---	---	---
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	15	<2	---	---	---
ortho-Xylene	95-47-6	2	µg/L	18	<2	---	---	---
^ Total Xylenes	1330-20-7	2	µg/L	33	<2	---	---	---
^ Sum of BTEX	---	1	µg/L	81	<1	---	---	---
Naphthalene	91-20-3	5	µg/L	20	<5	---	---	---
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	95.8	94.4	---	---	---
Toluene-D8	2037-26-5	0.1	%	103	81.7	---	---	---
4-Bromofluorobenzene	460-00-4	0.1	%	104	97.3	---	---	---



## Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP075(SIM): Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	10.0	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
<b>EP075(SIM): PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27.4	113
4-Terphenyl-d14	1718-51-0	32	112
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

## QUALITY CONTROL REPORT

<b>Work Order</b>	: <b>ES1327569</b>	Page	: 1 of 14
<b>Client</b>	: <b>ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: MR JONATHAN LEKAWSKI	<b>Contact</b>	: Barbara Hanna
<b>Address</b>	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: jonathan.lekawski@erm.com	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: SYMPHONY - DELTA WEST	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b>	: ----	<b>Date Samples Received</b>	: 17-DEC-2013
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: 02-JAN-2014
<b>Sampler</b>	: CHRIS FORD	<b>No. of samples received</b>	: 7
<b>Order number</b>	: 0207420/0207423	<b>No. of samples analysed</b>	: 7
<b>Quote number</b>	: SY/551/13 V4		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Organics



### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :  
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
RPD = Relative Percentage Difference  
# = Indicates failed QC



## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>ED037P: Alkalinity by PC Titrator (QC Lot: 3219751)</b>									
ES1327568-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	112	116	4.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	112	116	4.1	0% - 20%
ES1327568-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	201	189	6.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	201	189	6.3	0% - 20%
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3219724)</b>									
ES1327568-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	419	418	0.4	0% - 20%
ES1327570-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	176	176	0.0	0% - 20%
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3219767)</b>									
ES1327569-002	MH_MW02	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	18	18	0.0	0% - 50%
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3220645)</b>									
ES1327420-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	714	717	0.5	0% - 20%
EW1303713-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	68	68	0.0	0% - 20%
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3221296)</b>									
ES1327539-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	702	700	0.4	0% - 20%
ES1327567-010	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	291	319	9.3	0% - 20%
<b>ED045G: Chloride Discrete analyser (QC Lot: 3219726)</b>									
ES1327568-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	52	52	0.0	0% - 20%
ES1327570-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	10	11	0.0	0% - 50%
<b>ED045G: Chloride Discrete analyser (QC Lot: 3219765)</b>									
ES1327518-021	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	7	5	30.1	No Limit
ES1327569-002	MH_MW02	ED045G: Chloride	16887-00-6	1	mg/L	14	15	0.0	0% - 50%
<b>ED045G: Chloride Discrete analyser (QC Lot: 3220644)</b>									
ES1327375-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	319	320	0.5	0% - 20%
ES1327820-003	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	13	13	0.0	0% - 50%
<b>ED045G: Chloride Discrete analyser (QC Lot: 3221295)</b>									
ES1327454-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	62	62	0.0	0% - 20%
EW1303720-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	36	34	6.8	0% - 20%
<b>ED093F: Dissolved Major Cations (QC Lot: 3219725)</b>									
ES1327568-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	93	93	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	48	48	0.0	0% - 20%



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>ED093F: Dissolved Major Cations (QC Lot: 3219725) - continued</b>									
ES1327568-001	Anonymous	ED093F: Sodium	7440-23-5	1	mg/L	81	81	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	10	10	0.0	0% - 50%
ES1327570-004	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	21	21	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	20	21	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	38	39	3.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	5	5	0.0	No Limit
<b>ED093F: Dissolved Major Cations (QC Lot: 3219766)</b>									
ES1327543-005	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
ES1327821-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	5	5	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	3	3	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	10	10	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	1	1	0.0	No Limit
<b>ED093F: Dissolved Major Cations (QC Lot: 3220646)</b>									
ES1327592-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	9	9	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	1	1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	7300	7090	2.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
ES1327820-005	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	10	10	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
<b>ED093F: Dissolved Major Cations (QC Lot: 3221294)</b>									
ES1327454-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	39	39	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	13	13	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	54	53	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	55	48	12.8	0% - 20%
EW1303720-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	5	5	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	4	4	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	16	16	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
<b>EG020F: Dissolved Metals by ICP-MS (QC Lot: 3225658)</b>									
EB1331593-003	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG020F: Dissolved Metals by ICP-MS (QC Lot: 3225658) - continued</b>									
EB1331593-003	Anonymous	EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
ES1327806-003	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.102	0.107	4.6	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.119	0.133	11.2	0% - 20%
<b>EG035F: Dissolved Mercury by FIMS (QC Lot: 3225657)</b>									
EB1331593-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1327806-002	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
<b>EG051G: Ferrous Iron by Discrete Analyser (QC Lot: 3219859)</b>									
ES1327568-001	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	15.3	16.2	5.8	0% - 20%
ES1327570-001	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	2.34	2.33	0.0	0% - 20%
<b>EG051G: Ferrous Iron by Discrete Analyser (QC Lot: 3221562)</b>									
ES1327538-007	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	6.11	6.83	11.1	0% - 20%
ES1327647-002	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	9.43	8.80	6.9	0% - 50%
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 3231836)</b>									
ES1327568-001	Anonymous	EG094A-F: Cadmium	7440-43-9	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EG094A-F: Lead	7439-92-1	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG094A-F: Arsenic	7440-38-2	0.2	µg/L	1.2	1.1	0.0	No Limit
		EG094A-F: Chromium	7440-47-3	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG094A-F: Copper	7440-50-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG094A-F: Manganese	7439-96-5	0.5	µg/L	6890	6610	4.1	0% - 20%
		EG094A-F: Nickel	7440-02-0	0.5	µg/L	14.0	14.0	0.0	0% - 20%
		EG094A-F: Zinc	7440-66-6	1	µg/L	7	7	0.0	No Limit
ES1328110-010	Anonymous	EG094A-F: Boron	7440-42-8	5	µg/L	46	47	0.0	No Limit
		EG094A-F: Cadmium	7440-43-9	0.05	µg/L	0.34	0.34	0.0	No Limit
		EG094A-F: Lead	7439-92-1	0.1	µg/L	45.7	44.8	1.8	0% - 20%
		EG094A-F: Arsenic	7440-38-2	0.2	µg/L	4.2	4.1	3.8	0% - 20%
		EG094A-F: Chromium	7440-47-3	0.2	µg/L	14.3	14.4	0.8	0% - 20%
		EG094A-F: Copper	7440-50-8	0.5	µg/L	6.9	7.0	0.0	0% - 50%
		EG094A-F: Manganese	7439-96-5	0.5	µg/L	1690	1720	1.4	0% - 20%
		EG094A-F: Nickel	7440-02-0	0.5	µg/L	68.7	68.3	0.5	0% - 20%
		EG094A-F: Zinc	7440-66-6	1	µg/L	157	154	1.6	0% - 20%
EG094A-F: Boron	7440-42-8	5	µg/L	126	135	7.0	0% - 20%		
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 3231837)</b>									
ES1327568-001	Anonymous	EG094B-F: Selenium	7782-49-2	0.2	µg/L	<0.2	<0.2	0.0	No Limit
<b>EK040P: Fluoride by PC Titrator (QC Lot: 3219753)</b>									





Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EK040P: Fluoride by PC Titrator (QC Lot: 3219753) - continued</b>									
ES1327568-001	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.0	No Limit
ES1327568-004	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3223594)</b>									
ES1327568-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1327588-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3223594)</b>									
ES1327568-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES1327588-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3223594)</b>									
ES1327568-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES1327588-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit



### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>ED037P: Alkalinity by PC Titrator (QCLot: 3219751)</b>									
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	----	200 mg/L	90.7	81	111	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3219724)</b>									
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	106	86	122	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3219767)</b>									
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	105	86	122	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3220645)</b>									
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	111	86	122	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3221296)</b>									
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	109	86	122	
<b>ED045G: Chloride Discrete analyser (QCLot: 3219726)</b>									
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	96.0	77	123	
<b>ED045G: Chloride Discrete analyser (QCLot: 3219765)</b>									
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	94.3	77	123	
<b>ED045G: Chloride Discrete analyser (QCLot: 3220644)</b>									
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	95.7	77	123	
<b>ED045G: Chloride Discrete analyser (QCLot: 3221295)</b>									
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	97.2	77	123	
<b>ED093F: Dissolved Major Cations (QCLot: 3219725)</b>									
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	87	113	
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.0	89	113	
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	105	79	113	
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	108	87	115	
<b>ED093F: Dissolved Major Cations (QCLot: 3219766)</b>									
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	87	113	
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	104	89	113	
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	86.8	79	113	
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.6	87	115	
<b>ED093F: Dissolved Major Cations (QCLot: 3220646)</b>									
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	87	113	
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	104	89	113	
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	93.6	79	113	
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	100	87	115	
<b>ED093F: Dissolved Major Cations (QCLot: 3221294)</b>									



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>ED093F: Dissolved Major Cations (QCLot: 3221294) - continued</b>									
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	87	113	
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	104	89	113	
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	91.0	79	113	
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.7	87	115	
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3225658)</b>									
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	92.2	80	118	
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	89.0	82	112	
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	98.0	81	111	
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	97.2	80	112	
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	92.8	83	111	
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	95.0	81	113	
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	101	80	116	
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3225657)</b>									
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	104	78	114	
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3219859)</b>									
EG051G: Ferrous Iron	----	0.10	mg/L	<0.10	2.00 mg/L	103	89	113	
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3221562)</b>									
EG051G: Ferrous Iron	----	0.10	mg/L	<0.10	2.00 mg/L	96.9	89	113	
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3231836)</b>									
EG094A-F: Arsenic	7440-38-2	0.2	µg/L	<0.2	10 µg/L	97.5	75	129	
EG094A-F: Boron	7440-42-8	5	µg/L	<5	10 µg/L	124	79	129	
EG094A-F: Cadmium	7440-43-9	0.05	µg/L	<0.05	10 µg/L	96.9	78	112	
EG094A-F: Chromium	7440-47-3	0.2	µg/L	<0.2	10 µg/L	95.4	71	123	
EG094A-F: Copper	7440-50-8	0.5	µg/L	<0.5	10 µg/L	93.9	77	125	
EG094A-F: Lead	7439-92-1	0.1	µg/L	<0.1	10 µg/L	91.9	74	118	
EG094A-F: Manganese	7439-96-5	0.5	µg/L	<0.5	10 µg/L	97.5	79	119	
EG094A-F: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	105	72	128	
EG094A-F: Zinc	7440-66-6	1	µg/L	<1	10 µg/L	101	76	134	
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3231837)</b>									
EG094B-F: Selenium	7782-49-2	0.2	µg/L	<0.2	10 µg/L	88.3	75	125	
<b>EK040P: Fluoride by PC Titrator (QCLot: 3219753)</b>									
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5.0 mg/L	98.6	75	119	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3220888)</b>									
EP075(SIM): Phenol	108-95-2	0.2	µg/L	----	5 µg/L	36.6	24.5	61.9	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Chlorophenol	95-57-8	0.2	µg/L	----	5 µg/L	70.4	63.8	110	
		1	µg/L	<1.0	----	----	----	----	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3220888) - continued</b>									
EP075(SIM): 2-Methylphenol	95-48-7	0.2	µg/L	----	5 µg/L	67.2	55.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	0.4	µg/L	----	10 µg/L	60.7	42.5	114	
		2	µg/L	<2.0	----	----	----	----	
EP075(SIM): 2-Nitrophenol	88-75-5	0.2	µg/L	----	5 µg/L	89.4	62.7	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.2	µg/L	----	5 µg/L	79.6	59.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.2	µg/L	----	5 µg/L	70.4	59.3	122	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.2	µg/L	----	5 µg/L	70.7	64.3	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.2	µg/L	----	5 µg/L	71.8	63	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.2	µg/L	----	5 µg/L	76.8	58.7	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.2	µg/L	----	5 µg/L	76.3	50	108	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Pentachlorophenol	87-86-5	0.4	µg/L	----	10 µg/L	67.9	8.7	95	
		2	µg/L	<2.0	----	----	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3220888)</b>									
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	5 µg/L	68.2	58.6	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	5 µg/L	75.5	63.6	114	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	5 µg/L	69.0	62.2	113	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	5 µg/L	74.5	63.9	115	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	5 µg/L	72.4	62.6	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	5 µg/L	70.9	64.3	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	5 µg/L	80.5	63.6	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	5 µg/L	78.3	63.1	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	5 µg/L	79.9	64.1	117	
		1	µg/L	<1.0	----	----	----	----	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3220888) - continued</b>									
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	5 µg/L	75.3	62.5	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	5 µg/L	74.7	61.7	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	5 µg/L	85.8	61.7	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	5 µg/L	79.8	63.3	117	
		0.5	µg/L	<0.5	----	----	----	----	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	5 µg/L	77.9	59.9	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	----	5 µg/L	79.4	61.2	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	----	5 µg/L	82.6	59.1	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	1	µg/L	<1.0	----	----	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3220887)</b>									
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	81.7	59	129	
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	126	71	131	
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	84.5	62	120	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3223594)</b>									
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	95.2	75	127	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3220887)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	2500 µg/L	82.6	58.9	131	
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	114	73.9	138	
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----	
		50	µg/L	----	1500 µg/L	80.7	67	127	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3223594)</b>									
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	94.1	75	127	
<b>EP080: BTEXN (QCLot: 3223594)</b>									
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	82.7	70	124	
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	95.1	65	129	
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	91.8	70	120	
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	88.6	69	121	
	106-42-3								
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	94.9	72	122	
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	97.4	70	124	

Matrix Spike (MS) Report



The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%) MS	Recovery Limits (%)	
					Low	High	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3219724)</b>							
ES1327568-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3219767)</b>							
ES1327569-002	MH_MW02	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	84.4	70	130
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3220645)</b>							
ES1327420-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3221296)</b>							
ES1327539-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130
<b>ED045G: Chloride Discrete analyser (QCLot: 3219726)</b>							
ES1327568-001	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	94.5	70	130
<b>ED045G: Chloride Discrete analyser (QCLot: 3219765)</b>							
ES1327518-021	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	93.2	70	130
<b>ED045G: Chloride Discrete analyser (QCLot: 3220644)</b>							
ES1327375-001	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	86.9	70	130
<b>ED045G: Chloride Discrete analyser (QCLot: 3221295)</b>							
ES1327454-001	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	98.0	70	130
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3225658)</b>							
EB1331593-004	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	108	70	130
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	102	70	130
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	110	70	130
		EG020A-F: Copper	7440-50-8	0.2 mg/L	116	70	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	101	70	130
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	110	70	130
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	121	70	130
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3225657)</b>							
EB1331593-002	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	79.5	70	130
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3219859)</b>							
ES1327568-001	Anonymous	EG051G: Ferrous Iron	----	1.00 mg/L	# Not Determined	68	128
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3221562)</b>							
ES1327538-007	Anonymous	EG051G: Ferrous Iron	----	1.00 mg/L	# Not Determined	68	128



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report				
				Spike	Spike Recovery(%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3231836)</b>								
ES1327568-004	Anonymous	EG094A-F: Arsenic	7440-38-2	50 µg/L	120	70	130	
		EG094A-F: Cadmium	7440-43-9	12.5 µg/L	104	70	130	
		EG094A-F: Chromium	7440-47-3	50 µg/L	108	70	130	
		EG094A-F: Copper	7440-50-8	50 µg/L	102	70	130	
		EG094A-F: Lead	7439-92-1	50 µg/L	105	70	130	
		EG094A-F: Manganese	7439-96-5	50 µg/L	# Not Determined	70	130	
		EG094A-F: Nickel	7440-02-0	50 µg/L	111	70	130	
		EG094A-F: Zinc	7440-66-6	50 µg/L	108	70	130	
<b>EK040P: Fluoride by PC Titrator (QCLot: 3219753)</b>								
ES1327568-001	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	113	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3223594)</b>								
ES1327568-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	115	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3223594)</b>								
ES1327568-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	107	70	130	
<b>EP080: BTEXN (QCLot: 3223594)</b>								
ES1327568-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	88.0	70	130	
		EP080: Toluene	108-88-3	25 µg/L	87.7	70	130	
		EP080: Ethylbenzene	100-41-4	25 µg/L	96.0	70	130	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	98.7	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	25 µg/L	108	70	130	
EP080: Naphthalene	91-20-3	25 µg/L	93.4	70	130			

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3219724)</b>										
ES1327568-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	----	70	130	----	----
<b>ED045G: Chloride Discrete analyser (QCLot: 3219726)</b>										
ES1327568-001	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	94.5	----	70	130	----	----
<b>EK040P: Fluoride by PC Titrator (QCLot: 3219753)</b>										





Sub-Matrix: WATER

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
					MS	MSD	Low	High	Value	Control Limit	
<b>EK040P: Fluoride by PC Titrator (QCLot: 3219753) - continued</b>											
ES1327568-001	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	113	----	70	130	----	----	
<b>ED045G: Chloride Discrete analyser (QCLot: 3219765)</b>											
ES1327518-021	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	93.2	----	70	130	----	----	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3219767)</b>											
ES1327569-002	MH_MW02	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	84.4	----	70	130	----	----	
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3219859)</b>											
ES1327568-001	Anonymous	EG051G: Ferrous Iron	----	1.00 mg/L	# Not Determined	----	68	128	----	----	
<b>ED045G: Chloride Discrete analyser (QCLot: 3220644)</b>											
ES1327375-001	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	86.9	----	70	130	----	----	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3220645)</b>											
ES1327420-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	----	70	130	----	----	
<b>ED045G: Chloride Discrete analyser (QCLot: 3221295)</b>											
ES1327454-001	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	98.0	----	70	130	----	----	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3221296)</b>											
ES1327539-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	----	70	130	----	----	
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3221562)</b>											
ES1327538-007	Anonymous	EG051G: Ferrous Iron	----	1.00 mg/L	# Not Determined	----	68	128	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3223594)</b>											
ES1327568-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	115	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3223594)</b>											
ES1327568-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	107	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3223594)</b>											
ES1327568-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	88.0	----	70	130	----	----	
		EP080: Toluene	108-88-3	25 µg/L	87.7	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	25 µg/L	96.0	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	98.7	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	25 µg/L	108	----	70	130	----	----	
		EP080: Naphthalene	91-20-3	25 µg/L	93.4	----	70	130	----	----	
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3225657)</b>											
EB1331593-002	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	79.5	----	70	130	----	----	
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3225658)</b>											
EB1331593-004	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	108	----	70	130	----	----	



Sub-Matrix: WATER

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
				Concentration	MS	MSD	Low	High	Value	Control Limit
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3225658) - continued</b>										
EB1331593-004	Anonymous	EG020A-F: Cadmium	7440-43-9	0.05 mg/L	102	----	70	130	----	----
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	110	----	70	130	----	----
		EG020A-F: Copper	7440-50-8	0.2 mg/L	116	----	70	130	----	----
		EG020A-F: Lead	7439-92-1	0.2 mg/L	101	----	70	130	----	----
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	110	----	70	130	----	----
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	121	----	70	130	----	----
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3231836)</b>										
ES1327568-004	Anonymous	EG094A-F: Arsenic	7440-38-2	50 µg/L	120	----	70	130	----	----
		EG094A-F: Cadmium	7440-43-9	12.5 µg/L	104	----	70	130	----	----
		EG094A-F: Chromium	7440-47-3	50 µg/L	108	----	70	130	----	----
		EG094A-F: Copper	7440-50-8	50 µg/L	102	----	70	130	----	----
		EG094A-F: Lead	7439-92-1	50 µg/L	105	----	70	130	----	----
		EG094A-F: Manganese	7439-96-5	50 µg/L	# Not Determined	----	70	130	----	----
		EG094A-F: Nickel	7440-02-0	50 µg/L	111	----	70	130	----	----
		EG094A-F: Zinc	7440-66-6	50 µg/L	108	----	70	130	----	----

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1327569</b>	Page	: 1 of 9
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: SYMPHONY - DELTA WEST	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 17-DEC-2013
C-O-C number	: ----	Issue Date	: 02-JAN-2014
Sampler	: CHRIS FORD	No. of samples received	: 7
Order number	: 0207420/0207423	No. of samples analysed	: 7
Quote number	: SY/551/13 V4		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER** Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>ED037P: Alkalinity by PC Titrator</b>								
Clear Plastic Bottle - Natural (ED037-P) MF_MW04, MF_MW05,	MH_MW02, D01_161213CF	16-DEC-2013	---	30-DEC-2013	----	19-DEC-2013	30-DEC-2013	✓
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Clear Plastic Bottle - Natural (ED041G) MH_MW02,	MF_MW05	16-DEC-2013	---	13-JAN-2014	----	18-DEC-2013	13-JAN-2014	✓
Clear Plastic Bottle - Natural (ED041G) MF_MW04,	D01_161213CF	16-DEC-2013	---	13-JAN-2014	----	19-DEC-2013	13-JAN-2014	✓
<b>ED045G: Chloride Discrete analyser</b>								
Clear Plastic Bottle - Natural (ED045G) MH_MW02,	MF_MW05	16-DEC-2013	---	13-JAN-2014	----	18-DEC-2013	13-JAN-2014	✓
Clear Plastic Bottle - Natural (ED045G) MF_MW04,	D01_161213CF	16-DEC-2013	---	13-JAN-2014	----	19-DEC-2013	13-JAN-2014	✓
<b>ED093F: Dissolved Major Cations</b>								
Clear Plastic Bottle - Natural (ED093F) MH_MW02,	MF_MW05	16-DEC-2013	---	23-DEC-2013	----	18-DEC-2013	23-DEC-2013	✓
Clear Plastic Bottle - Natural (ED093F) MF_MW04,	D01_161213CF	16-DEC-2013	---	23-DEC-2013	----	19-DEC-2013	23-DEC-2013	✓
<b>EG020F: Dissolved Metals by ICP-MS</b>								
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F) RB01_161213CF		16-DEC-2013	---	14-JUN-2014	----	22-DEC-2013	14-JUN-2014	✓
<b>EG035F: Dissolved Mercury by FIMS</b>								
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG035F) MF_MW04, MF_MW05,	MH_MW02, D01_161213CF	16-DEC-2013	---	13-JAN-2014	----	23-DEC-2013	13-JAN-2014	✓
Clear Plastic Bottle - Filtered; Lab-acidified (EG035F) RB01_161213CF		16-DEC-2013	---	13-JAN-2014	----	23-DEC-2013	13-JAN-2014	✓
<b>EG051G: Ferrous Iron by Discrete Analyser</b>								
Clear Plastic Bottle - HCl - Filtered (EG051G) MF_MW05,	D01_161213CF	16-DEC-2013	----	----	----	18-DEC-2013	23-DEC-2013	✓
Clear Plastic Bottle - HCl - Filtered (EG051G) MF_MW04,	MH_MW02	16-DEC-2013	----	----	----	19-DEC-2013	23-DEC-2013	✓



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS</b>							
<b>Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094A-F)</b> MF_MW04, MH_MW02, MF_MW05, D01_161213CF	16-DEC-2013	---	14-JUN-2014	----	30-DEC-2013	14-JUN-2014	✓
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS</b>							
<b>Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094B-F)</b> MF_MW04, MH_MW02, MF_MW05, D01_161213CF	16-DEC-2013	---	14-JUN-2014	----	30-DEC-2013	14-JUN-2014	✓
<b>EK040P: Fluoride by PC Titrator</b>							
<b>Clear Plastic Bottle - Natural (EK040P)</b> MF_MW04, MH_MW02, MF_MW05, D01_161213CF	16-DEC-2013	---	13-JAN-2014	----	19-DEC-2013	13-JAN-2014	✓
<b>EP080/071: Total Petroleum Hydrocarbons</b>							
<b>Amber Glass Bottle - Unpreserved (EP071)</b> MF_MW04, MH_MW02, MF_MW05, D01_161213CF, RB01_161213CF	16-DEC-2013	23-DEC-2013	23-DEC-2013	✓	27-DEC-2013	01-FEB-2014	✓
<b>EP075(SIM)A: Phenolic Compounds</b>							
<b>Amber Glass Bottle - Unpreserved (EP075(SIM))</b> MF_MW04, MH_MW02, MF_MW05, D01_161213CF, RB01_161213CF	16-DEC-2013	23-DEC-2013	23-DEC-2013	✓	27-DEC-2013	01-FEB-2014	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>							
<b>Amber Glass Bottle - Unpreserved (EP075(SIM))</b> MF_MW04, MH_MW02, MF_MW05, D01_161213CF, RB01_161213CF	16-DEC-2013	23-DEC-2013	23-DEC-2013	✓	27-DEC-2013	01-FEB-2014	✓
<b>EP080: BTEXN</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MF_MW04, MH_MW02, MF_MW05, D01_161213CF, RB01_161213CF, TS, TB	16-DEC-2013	22-DEC-2013	30-DEC-2013	✓	22-DEC-2013	30-DEC-2013	✓
<b>EP080/071: Total Petroleum Hydrocarbons</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MF_MW04, MH_MW02, MF_MW05, D01_161213CF, RB01_161213CF, TB	16-DEC-2013	22-DEC-2013	30-DEC-2013	✓	22-DEC-2013	30-DEC-2013	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Reaular	Actual	Expected	Evaluation	
<b>Laboratory Duplicates (DUP)</b>							
Alkalinity by PC Titrator	ED037-P	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	8	73	11.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	2	12	16.7	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	2	11	18.2	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	1	10	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	4	40	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	8	70	11.4	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	7	53	13.2	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
Alkalinity by PC Titrator	ED037-P	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	8	73	11.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	1	10	10.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	4	70	5.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	53	7.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
Chloride by Discrete Analyser	ED045G	4	73	5.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	1	10	10.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	4	70	5.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	53	7.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



Matrix: **WATER** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Method Blanks (MB) - Continued</b>							
TPH - Semivolatile Fraction	EP071	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
Chloride by Discrete Analyser	ED045G	4	73	5.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	53	7.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement





## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Sulfate (Turbidimetric) as SO <sub>4</sub> <sup>2-</sup> by Discrete Analyser	ED041G	WATER	APHA 21st ed., 4500-SO <sub>4</sub> Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> <sup>2-</sup> concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Chloride by Discrete Analyser	ED045G	WATER	APHA 21st ed., 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	Major Cations is determined based on APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um filtered sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Hardness parameters are calculated based on APHA 21st ed., 2340 B. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): Samples are 0.45 um filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) Samples are 0.45 um filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Ferrous Iron by Discrete Analyser	EG051G	WATER	APHA 21st ed., 3500 Fe-B. A colorimetric determination based on the reaction between phenanthroline and ferrous iron at pH 3.2-3.3 to form an orange-red complex that is measured against a five-point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)



Analytical Methods	Method	Matrix	Method Descriptions
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Fluoride by PC Titrator	EK040P	WATER	APHA 21st ed., 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by Turbi SO4 by DA. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
TPH - Semivolatle Fraction	EP071	WATER	USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
TPH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
Lab Acidification of Dissolved Metals	EN80F	WATER	US EPA Method 200.8
Separatory Funnel Extraction of Liquids	ORG14	WATER	USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.



## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Matrix Spike (MS) Recoveries</b>							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	ES1327568-001	Anonymous	Sulfate as SO4 - Turbidimetric	14808-79-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	ES1327420-004	Anonymous	Sulfate as SO4 - Turbidimetric	14808-79-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	ES1327539-001	Anonymous	Sulfate as SO4 - Turbidimetric	14808-79-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG051G: Ferrous Iron by Discrete Analyser	ES1327538-007	Anonymous	Ferrous Iron	----	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG051G: Ferrous Iron by Discrete Analyser	ES1327568-001	Anonymous	Ferrous Iron	----	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG094F: Dissolved Metals in Fresh Water by ORC-ICP	ES1327568-004	Anonymous	Manganese	7439-96-5	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.

#### Regular Sample Surrogates

Sub-Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Samples Submitted</b>							
EP075(SIM)S: Phenolic Compound Surrogates	ES1327569-002	MH_MW02	Phenol-d6	13127-88-3	44.0 %	10.0-44 %	Recovery greater than upper data quality objective
EP075(SIM)S: Phenolic Compound Surrogates	ES1327569-005	RB01_161213CF	Phenol-d6	13127-88-3	50.8 %	10.0-44 %	Recovery greater than upper data quality objective

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.



- **No Analysis Holding Time Outliers exist.**

### ***Outliers : Frequency of Quality Control Samples***

The following report highlights breaches in the Frequency of Quality Control Samples.

- **No Quality Control Sample Frequency Outliers exist.**
-

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

<b>Work Order</b>	<b>: ES1327569</b>		
<b>Client</b>	<b>: ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	<b>: Environmental Division Sydney</b>
<b>Contact Address</b>	<b>: MR JONATHAN LEKAWSKI 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007</b>	<b>Contact Address</b>	<b>: Barbara Hanna 277-289 Woodpark Road Smithfield NSW Australia 2164</b>
<b>E-mail</b>	<b>: jonathan.lekawski@erm.com</b>	<b>E-mail</b>	<b>: Barbara.Hanna@alsglobal.com</b>
<b>Telephone</b>	<b>: +61 02 8584 8888</b>	<b>Telephone</b>	<b>: +61 2 8784 8555</b>
<b>Facsimile</b>	<b>: +61 02 8584 8800</b>	<b>Facsimile</b>	<b>: +61 2 8784 8555</b>
<b>Project</b>	<b>: SYMPHONY - DELTA WEST</b>	<b>Page</b>	<b>: 1 of 3</b>
<b>Order number</b>	<b>: 0207420/0207423</b>	<b>Quote number</b>	<b>: ES2013ENVRES0360 (SY/551/13 V4)</b>
<b>C-O-C number</b>	<b>: ----</b>	<b>QC Level</b>	<b>: NEPM 2013 Schedule B(3) and ALS QCS3 requirement</b>
<b>Site</b>	<b>: ----</b>		
<b>Sampler</b>	<b>: CHRIS FORD</b>		

#### Dates

<b>Date Samples Received</b> : 17-DEC-2013	<b>Issue Date</b> : 18-DEC-2013 18:18
<b>Client Requested Due Date</b> : 02-JAN-2014	<b>Scheduled Reporting Date</b> : <b>02-JAN-2014</b>

#### Delivery Details

<b>Mode of Delivery</b> : Carrier	<b>Temperature</b> : 4.1°C - Ice present
<b>No. of coolers/boxes</b> : 1 HARD	<b>No. of samples received</b> : 7
<b>Security Seal</b> : Intact.	<b>No. of samples analysed</b> : 7

#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EG035F Dissolved Mercury by FIMS	WATER - EG051G Ferrous Iron by Discrete Analyser	WATER - EG093A-F Dissolved metals in saline water by ORC-ICPMS	WATER - EG093B-F Dissolved Metals in Saline Water Suite B by	WATER - EK040-P Fluoride(PC)	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP080 BTEXN	WATER - NT-01 Major Cations (Ca, Mg, Na, K)
ES1327569-001	16-DEC-2013 17:08	MF_MW04	✓	✓	✓	✓	✓	✓		✓
ES1327569-002	16-DEC-2013 15:23	MH_MW02	✓	✓	✓	✓	✓	✓		✓
ES1327569-003	16-DEC-2013 11:12	MF_MW05	✓	✓	✓	✓	✓	✓		✓
ES1327569-004	16-DEC-2013 15:00	D01_161213CF	✓	✓	✓	✓	✓	✓		✓
ES1327569-006	16-DEC-2013 15:00	TS							✓	

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)	WATER - W-18 TRH(C6 - C9)/BTEXN	WATER - W-24 TPH/BTEX/PAH/Phenols	WATER - W-27 TRH/BTEXN/PAH/Phenols/8 Metals
ES1327569-001	16-DEC-2013 17:08	MF_MW04	✓		✓	
ES1327569-002	16-DEC-2013 15:23	MH_MW02	✓		✓	
ES1327569-003	16-DEC-2013 11:12	MF_MW05	✓		✓	
ES1327569-004	16-DEC-2013 15:00	D01_161213CF	✓		✓	
ES1327569-005	16-DEC-2013 15:00	RB01_161213CF				✓
ES1327569-007	16-DEC-2013 15:00	TB		✓		

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
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Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
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- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
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Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com

### SYMPHONY ERARING

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email Symphony.Eraring@erm.com  
Email Symphony.Eraring@erm.com  
Email Symphony.Eraring@erm.com  
Email Symphony.Eraring@erm.com  
Email Symphony.Eraring@erm.com  
Email Symphony.Eraring@erm.com  
Email Symphony.Eraring@erm.com  
Email Symphony.Eraring@erm.com  
Email Symphony.Eraring@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com



## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

**Work Order : ES1327569**

<b>Client : ENVIRO RESOURCES MANAGEMENT</b> <b>Contact : MR JONATHAN LEKAWSKI</b> <b>Address : GROUND FLOOR</b> 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Laboratory : Environmental Division Sydney</b>  <b>Contact : Barbara Hanna</b> <b>Address : 277-289 Woodpark Road Smithfield</b> NSW Australia 2164
---	--

<b>E-mail : jonathan.lekawski@erm.com</b> <b>Telephone : +61 02 8584 8888</b> <b>Facsimile : +61 02 8584 8800</b>	<b>E-mail : Barbara.Hanna@alsglobal.com</b> <b>Telephone : +61 2 8784 8555</b> <b>Facsimile : +61 2 8784 8555</b>
---	---

<b>Project : SYMPHONY - DELTA WEST</b> <b>Order number : 0207420/0207423</b> <b>C-O-C number : ----</b> <b>Site : ----</b> <b>Sampler : CHRIS FORD</b>	<b>Page : 1 of 3</b>  <b>Quote number : ES2013ENVRES0360 (SY/551/13 V4)</b>  <b>QC Level : NEPM 2013 Schedule B(3) and ALS QCS3 requirement</b>
--	---

#### Dates

<b>Date Samples Received : 17-DEC-2013</b> <b>Client Requested Due Date : 02-JAN-2014</b>	<b>Issue Date : 27-DEC-2013 14:06</b> <b>Scheduled Reporting Date : 02-JAN-2014</b>
--	--

#### Delivery Details

<b>Mode of Delivery : Carrier</b> <b>No. of coolers/boxes : 1 HARD</b> <b>Security Seal : Intact.</b>	<b>Temperature : 4.1°C - Ice present</b> <b>No. of samples received : 7</b> <b>No. of samples analysed : 7</b>
---	--

#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Sample T01 to be forwarded to Envirolab.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EG035F Dissolved Mercury by FIMS	WATER - EG051G Ferrous Iron by Discrete Analyser	WATER - EG094A-F Dissolved Metals in Fresh Water Suite A by	WATER - EG094B-F Dissolved Metals in fresh water Suite B by	WATER - EK040-P Fluoride(PC)	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP080 BTEXN	WATER - NT-01 Major Cations (Ca, Mg, Na, K)
ES1327569-001	16-DEC-2013 17:08	MF_MW04	✓	✓	✓	✓	✓	✓		✓
ES1327569-002	16-DEC-2013 15:23	MH_MW02	✓	✓	✓	✓	✓	✓		✓
ES1327569-003	16-DEC-2013 11:12	MF_MW05	✓	✓	✓	✓	✓	✓		✓
ES1327569-004	16-DEC-2013 15:00	D01_161213CF	✓	✓	✓	✓	✓	✓		✓
ES1327569-006	16-DEC-2013 15:00	TS							✓	

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)	WATER - W-18 TRH(C6 - C9)/BTEXN	WATER - W-24 TPH/BTEX/PAH/Phenols	WATER - W-27 TRH/BTEXN/PAH/Phenols/8 Metals
ES1327569-001	16-DEC-2013 17:08	MF_MW04	✓		✓	
ES1327569-002	16-DEC-2013 15:23	MH_MW02	✓		✓	
ES1327569-003	16-DEC-2013 11:12	MF_MW05	✓		✓	
ES1327569-004	16-DEC-2013 15:00	D01_161213CF	✓		✓	
ES1327569-005	16-DEC-2013 15:00	RB01_161213CF				✓
ES1327569-007	16-DEC-2013 15:00	TB		✓		

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV ) Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA ) Email jonathan.lekawski@erm.com  
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI ) Email jonathan.lekawski@erm.com  
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### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA ) Email symphony.deltawest@erm.com  
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI ) Email symphony.deltawest@erm.com  
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC ) Email symphony.deltawest@erm.com  
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN ) Email symphony.deltawest@erm.com  
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- EDI Format - XTab ( XTAB ) Email Symphony.Eraring@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV ) Email au.accounts@erm.com



# CHAIN OF CUSTODY

ALS Laboratory  
 please tick ->

LABORATORY: 21 Burma Road Rozelle NSW 1585  
 Ph: 02 9550 0800 E: rozelle@als.com.au

LABORATORY: 78 Highbury Road Highbury QLD 4100  
 Ph: 07 4646 0177 E: mackay@als.com.au

LABORATORY: 272-289 Woodpark Road Southfield NSW 2164  
 Ph: 02 8734 8555 E: samples@als.com.au

CLIENT: **ERM**      TURNAROUND REQUIREMENTS:  Standard TAT (List due date)     Non Standard or urgent TAT (List due date)

OFFICE: **GROUND FLOOR, 33 SAUNDERS ST, PYRMONT NSW 2009**      ALS QUOTE NO.: **SV165/143 V4**

PROJECT: **Symphony - Delta West**      (Standard TAT may be longer for some tests eg. Ultra Trace Organics)

ORDER NUMBER: **02072420/207423**      CONTACT PH: **8584 8888**

PROJECT MANAGER: **Jonathan Lelawski**      CONTRACT PH: **8584 8888**

SAMPLER: **Chris Ford**      SAMPLER MOBILE: **0472447671**      RELINQUISHED BY: **Chris Ford**      RECEIVED BY: **Steven**

COC emailed to ALS? (YES / NO)      EDD FORMAT (or default): **ESDATT/DP/ALS**      DATE/TIME: **16/12/13**      DATE/TIME: **17/12/13 11:10**

Email Reports to (will default to PM if no other addresses are listed): **Symphony.DeltaWest@erm.com**      DATE/TIME: **16/12/13**

Email Invoice to (will default to PM if no other addresses are listed): **Symphony.DeltaWest@erm.com**

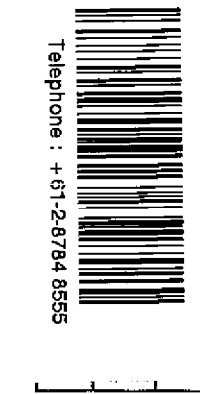
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below)	TOTAL CONTAINERS	ANALYSIS REQUIRED (Where Metals are required, specify Total (unfiltered) or Dissolved (filtered) bottle required)	Additional Information
1	MF_MWB4	1708 16.12.13 W	W		6	W-4 (TPH/TRH) (C6-C36 or 40) BTEXN 8 Ultra Trace Dissolved Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg) - Additional Metals Ultra Trace - Se, Bo, Fl, Mn Ferrous Iron PAH/Phenols VOC Scan PCB Cations/Anions	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
2	MH_MMW02	1528 16.12.13 W	W		6		
3	MF_MMW05	112 16.12.13 W	W		6		
4	DD1_161213CF	- 16.12.13 W	W		6		
5	DD1_161213CF	- 16.12.13 W	W		6		
6	RB01_161213CF	16.12.13 W	W		4		PLS FW O TO ENVIRONMENTAL
7	TS TB	" "					

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORG = Nitric Preserved ORG; SH = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airtight Unpreserved Plastic  
 V = VOA Vol HCl Preserved; VB = VOA Vol Sodium Bisulphate Preserved; VS = VOA Vol Sulfuric Preserved; AV = Airtight Unpreserved Vol SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation bottle; SP = Sulfuric Pres  
 Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag

FOR LABORATORY USE ONLY (GISA)  
 Customer Name: \_\_\_\_\_  
 Analyst: \_\_\_\_\_  
 Received: \_\_\_\_\_  
 Date: \_\_\_\_\_

Environmental Division  
 Sydney  
 Work Order  
**ES1327569**



Telephone : + 61-2-8784 8555

## CERTIFICATE OF ANALYSIS

Work Order	: <b>ES1327570</b>	Page	: 1 of 15
Client	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: 0207423 SYMPHONY - MT PIPER	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: 09787	Date Samples Received	: 17-DEC-2013
Sampler	: T.SHAW	Issue Date	: 30-DEC-2013
Site	: MT PIPER		
Quote number	: SY/551/13 V4	No. of samples received	: 9
		No. of samples analysed	: 9

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
^ = This result is computed from individual analyte detections at or above the level of reporting

- **EP080: Sample TRIP SPIKE contains volatile compounds spiked into the sample containers prior to dispatch from the laboratory. BTEX compounds spiked at 20 ug/L.**
- **Ionic Balance out of acceptable limits for sample 6 due to analytes not quantified in this report.**



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

## Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Hoa Nguyen	Senior Inorganic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Organics



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MA_MW07	D01_161213_TB	ML_MW12	MA_MW01	MA_MW12
				17-DEC-2013 15:00	16-DEC-2013 11:20	16-DEC-2013 12:20	16-DEC-2013 14:05	16-DEC-2013 15:00
Compound	CAS Number	LOR	Unit	ES1327570-001	ES1327570-002	ES1327570-003	ES1327570-004	ES1327570-005
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	44	49	114	196	63
Total Alkalinity as CaCO3	----	1	mg/L	44	49	114	196	63
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	175	176	56	24	177
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	11	10	77	12	19
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	25	25	18	21	32
Magnesium	7439-95-4	1	mg/L	27	26	17	20	36
Sodium	7440-23-5	1	mg/L	21	21	67	38	25
Potassium	7440-09-7	1	mg/L	10	10	8	5	7
<b>EG020F: Dissolved Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	0.002	0.004
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.002	0.002	<0.001
Nickel	7440-02-0	0.001	mg/L	0.056	0.058	0.017	0.084	0.042
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.006	<0.001	<0.001
Zinc	7440-66-6	0.005	mg/L	0.089	0.086	0.050	0.056	0.016
Manganese	7439-96-5	0.001	mg/L	1.80	1.84	2.92	9.87	2.48
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05
<b>EG035F: Dissolved Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
<b>EG051G: Ferrous Iron by Discrete Analyser</b>								
Ferrous Iron	----	0.05	mg/L	2.34	----	3.68	20.6	10.6
<b>EK040P: Fluoride by PC Titrator</b>								
Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1
<b>EN055: Ionic Balance</b>								
Total Anions	----	0.01	meq/L	4.83	4.93	5.62	4.75	----
Total Anions	----	0.01	meq/L	----	----	----	----	5.60





## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				MA_MW07	D01_161213_TB	ML_MW12	MA_MW01	MA_MW12
				17-DEC-2013 15:00	16-DEC-2013 11:20	16-DEC-2013 12:20	16-DEC-2013 14:05	16-DEC-2013 15:00
Compound	CAS Number	LOR	Unit	ES1327570-001	ES1327570-002	ES1327570-003	ES1327570-004	ES1327570-005
<b>EN055: Ionic Balance - Continued</b>								
Total Cations	----	0.01	meq/L	----	----	5.42	----	----
Total Cations	----	0.01	meq/L	4.72	4.74	----	4.69	5.83
Ionic Balance	----	0.01	%	----	----	1.82	----	----
Ionic Balance	----	0.01	%	1.17	1.89	----	0.73	1.99
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	1	µg/L	<1	<1	<1	<1	<1
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	5	µg/L	<5	<5	<5	<5	<5
Isopropylbenzene	98-82-8	5	µg/L	<5	<5	<5	<5	<5
n-Propylbenzene	103-65-1	5	µg/L	<5	<5	<5	<5	<5
1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	<5	<5	<5
sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	<5	<5	<5
1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	<5	<5	<5
tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	<5	<5	<5
p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	<5	<5	<5
n-Butylbenzene	104-51-8	5	µg/L	<5	<5	<5	<5	<5
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	50	µg/L	<50	<50	<50	<50	<50
2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	<50	<50	<50
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	<50	<50	<50
2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	<50	<50	<50
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	5	µg/L	<5	<5	<5	<5	<5
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	<5	<5	<5
1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	<5	<5	<5
cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	<5	<5	<5
trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	<5	<5	<5
1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	<5	<5	<5
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	<50	<50	<50
Chloromethane	74-87-3	50	µg/L	<50	<50	<50	<50	<50
Vinyl chloride	75-01-4	50	µg/L	<50	<50	<50	<50	<50



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MA_MW07	D01_161213_TB	ML_MW12	MA_MW01	MA_MW12
				17-DEC-2013 15:00	16-DEC-2013 11:20	16-DEC-2013 12:20	16-DEC-2013 14:05	16-DEC-2013 15:00
Compound	CAS Number	LOR	Unit	ES1327570-001	ES1327570-002	ES1327570-003	ES1327570-004	ES1327570-005
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
Bromomethane	74-83-9	50	µg/L	<50	<50	<50	<50	<50
Chloroethane	75-00-3	50	µg/L	<50	<50	<50	<50	<50
Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	<50	<50	<50
1,1-Dichloroethene	75-35-4	5	µg/L	<5	<5	<5	<5	<5
Iodomethane	74-88-4	5	µg/L	<5	<5	<5	<5	<5
trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	<5	<5	<5	<5
1,1-Dichloroethane	75-34-3	5	µg/L	<5	<5	<5	<5	<5
cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	<5	<5	<5	<5
1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	<5	<5	<5	<5
1,1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	<5	<5	<5
Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	<5	<5	<5
1,2-Dichloroethane	107-06-2	5	µg/L	<5	<5	<5	<5	<5
Trichloroethene	79-01-6	5	µg/L	<5	<5	<5	<5	<5
Dibromomethane	74-95-3	5	µg/L	<5	<5	<5	<5	<5
1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	<5	<5	<5	<5
1,3-Dichloropropane	142-28-9	5	µg/L	<5	<5	<5	<5	<5
Tetrachloroethene	127-18-4	5	µg/L	<5	<5	<5	<5	<5
1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	<5	<5	<5
trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	<5	<5	<5
cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	<5	<5	<5
1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	<5	<5	<5	<5
Pentachloroethane	76-01-7	5	µg/L	<5	<5	<5	<5	<5
1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	<5	<5	<5
Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	<5	<5	<5
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	5	µg/L	<5	<5	<5	<5	<5
Bromobenzene	108-86-1	5	µg/L	<5	<5	<5	<5	<5
2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	<5	<5	<5
4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	<5	<5	<5
1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	<5	<5	<5
1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	<5	<5	<5
1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	<5	<5	<5
1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	<5	<5	<5



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				MA_MW07	D01_161213_TB	ML_MW12	MA_MW01	MA_MW12
				17-DEC-2013 15:00	16-DEC-2013 11:20	16-DEC-2013 12:20	16-DEC-2013 14:05	16-DEC-2013 15:00
				ES1327570-001	ES1327570-002	ES1327570-003	ES1327570-004	ES1327570-005
Compound	CAS Number	LOR	Unit					
<b>EP074F: Halogenated Aromatic Compounds - Continued</b>								
1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	<5	<5	<5
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	5	µg/L	<5	<5	<5	<5	<5
Bromodichloromethane	75-27-4	5	µg/L	<5	<5	<5	<5	<5
Dibromochloromethane	124-48-1	5	µg/L	<5	<5	<5	<5	<5
Bromoform	75-25-2	5	µg/L	<5	<5	<5	<5	<5
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	7	µg/L	<7	<7	<7	<7	<7
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				MA_MW07	D01_161213_TB	ML_MW12	MA_MW01	MA_MW12
				17-DEC-2013 15:00	16-DEC-2013 11:20	16-DEC-2013 12:20	16-DEC-2013 14:05	16-DEC-2013 15:00
				ES1327570-001	ES1327570-002	ES1327570-003	ES1327570-004	ES1327570-005
Compound	CAS Number	LOR	Unit					
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	74.0	61.5	67.5	65.0	80.3



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MA_MW07	D01_161213_TB	ML_MW12	MA_MW01	MA_MW12
				17-DEC-2013 15:00	16-DEC-2013 11:20	16-DEC-2013 12:20	16-DEC-2013 14:05	16-DEC-2013 15:00
Compound	CAS Number	LOR	Unit	ES1327570-001	ES1327570-002	ES1327570-003	ES1327570-004	ES1327570-005
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	100	84.2	108	99.5	99.8
Toluene-D8	2037-26-5	0.1	%	125	102	117	126	124
4-Bromofluorobenzene	460-00-4	0.1	%	114	100	110	111	110
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	21.9	21.2	19.2	18.6	26.4
2-Chlorophenol-D4	93951-73-6	0.1	%	49.0	44.8	41.2	39.1	53.6
2,4,6-Tribromophenol	118-79-6	0.1	%	59.0	59.4	47.3	61.9	69.5
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	45.6	41.5	36.0	37.1	46.3
Anthracene-d10	1719-06-8	0.1	%	64.8	62.5	55.0	53.7	73.9
4-Terphenyl-d14	1718-51-0	0.1	%	72.1	72.3	65.5	60.2	84.8
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	114	108	112	113	113
Toluene-D8	2037-26-5	0.1	%	110	123	115	110	108
4-Bromofluorobenzene	460-00-4	0.1	%	116	123	118	113	112



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MC_MW01	MC_MW02	TS (5)	TB (2)	----
				16-DEC-2013 15:50	16-DEC-2013 16:36	16-DEC-2013 15:00	16-DEC-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1327570-006	ES1327570-007	ES1327570-008	ES1327570-009	----
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	225	240	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	225	240	----	----	----
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	18	79	----	----	----
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	20	29	----	----	----
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	45	67	----	----	----
Magnesium	7439-95-4	1	mg/L	20	27	----	----	----
Sodium	7440-23-5	1	mg/L	12	26	----	----	----
Potassium	7440-09-7	1	mg/L	19	27	----	----	----
<b>EG020F: Dissolved Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L	0.001	0.002	----	----	----
Nickel	7440-02-0	0.001	mg/L	0.002	0.011	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	0.026	----	----	----
Zinc	7440-66-6	0.005	mg/L	0.014	0.017	----	----	----
Manganese	7439-96-5	0.001	mg/L	0.236	1.66	----	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	----	----	----
Boron	7440-42-8	0.05	mg/L	<0.05	0.05	----	----	----
<b>EG035F: Dissolved Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	----	----	----
<b>EG051G: Ferrous Iron by Discrete Analyser</b>								
Ferrous Iron	----	0.05	mg/L	4.30	<0.05	----	----	----
<b>EK040P: Fluoride by PC Titrator</b>								
Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	----	----	----
<b>EN055: Ionic Balance</b>								
Total Anions	----	0.01	meq/L	5.43	7.26	----	----	----
Total Cations	----	0.01	meq/L	----	7.39	----	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MC_MW01	MC_MW02	TS (5)	TB (2)	----
				16-DEC-2013 15:50	16-DEC-2013 16:36	16-DEC-2013 15:00	16-DEC-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1327570-006	ES1327570-007	ES1327570-008	ES1327570-009	----
<b>EN055: Ionic Balance - Continued</b>								
Total Cations	----	0.01	meq/L	5.13	----	----	----	----
Ionic Balance	----	0.01	%	----	0.89	----	----	----
Ionic Balance	----	0.01	%	2.92	----	----	----	----
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	1	µg/L	<1	<1	----	----	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	5	µg/L	<5	<5	----	----	----
Isopropylbenzene	98-82-8	5	µg/L	<5	<5	----	----	----
n-Propylbenzene	103-65-1	5	µg/L	<5	<5	----	----	----
1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	----	----	----
sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	----	----	----
1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	----	----	----
tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	----	----	----
p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	----	----	----
n-Butylbenzene	104-51-8	5	µg/L	<5	<5	----	----	----
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	50	µg/L	<50	<50	----	----	----
2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	----	----	----
2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	----	----	----
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	5	µg/L	<5	<5	----	----	----
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	----	----	----
1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	----	----	----
cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	----	----	----
trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	----	----	----
1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	----	----	----
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	----	----	----
Chloromethane	74-87-3	50	µg/L	<50	<50	----	----	----
Vinyl chloride	75-01-4	50	µg/L	<50	<50	----	----	----
Bromomethane	74-83-9	50	µg/L	<50	<50	----	----	----





## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MC_MW01	MC_MW02	TS (5)	TB (2)	----
				16-DEC-2013 15:50	16-DEC-2013 16:36	16-DEC-2013 15:00	16-DEC-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1327570-006	ES1327570-007	ES1327570-008	ES1327570-009	----
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
Chloroethane	75-00-3	50	µg/L	<50	<50	----	----	----
Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	----	----	----
1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	----	----	----
Iodomethane	74-88-4	5	µg/L	<5	<5	----	----	----
trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	----	----	----
1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	----	----	----
cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	----	----	----
1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	----	----	----
1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	----	----	----
Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	----	----	----
1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	----	----	----
Trichloroethene	79-01-6	5	µg/L	<5	<5	----	----	----
Dibromomethane	74-95-3	5	µg/L	<5	<5	----	----	----
1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	----	----	----
1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	----	----	----
Tetrachloroethene	127-18-4	5	µg/L	<5	<5	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	----	----	----
1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	----	----	----
Pentachloroethane	76-01-7	5	µg/L	<5	<5	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	----	----	----
Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	----	----	----
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	5	µg/L	<5	<5	----	----	----
Bromobenzene	108-86-1	5	µg/L	<5	<5	----	----	----
2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	----	----	----
4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	----	----	----
1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	----	----	----
1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	----	----	----
1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	----	----	----
1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	----	----	----
1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	----	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				MC_MW01	MC_MW02	TS (5)	TB (2)	----
Client sampling date / time				16-DEC-2013 15:50	16-DEC-2013 16:36	16-DEC-2013 15:00	16-DEC-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1327570-006	ES1327570-007	ES1327570-008	ES1327570-009	----
<b>EP074F: Halogenated Aromatic Compounds - Continued</b>								
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	5	µg/L	<5	<5	----	----	----
Bromodichloromethane	75-27-4	5	µg/L	<5	<5	----	----	----
Dibromochloromethane	124-48-1	5	µg/L	<5	<5	----	----	----
Bromoform	75-25-2	5	µg/L	<5	<5	----	----	----
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	7	µg/L	<7	<7	----	----	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	----	----	----
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	----	----	----
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	----	----	----
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	----	----	----
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	----	----	----
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	----	----	----
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	----	----	----
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	----	----	----
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	----	----	----
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	----	----	----
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	----	----	----
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	----	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	----	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	----	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	----	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	----	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	----	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	----	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	----	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	----	----	----
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	----	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MC_MW01	MC_MW02	TS (5)	TB (2)	----
				16-DEC-2013 15:50	16-DEC-2013 16:36	16-DEC-2013 15:00	16-DEC-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1327570-006	ES1327570-007	ES1327570-008	ES1327570-009	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	----	----	----
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	----	----	----
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	----	----	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	20	µg/L	<20	<20	----	<20	----
C10 - C14 Fraction	----	50	µg/L	<50	<50	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	----	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	----	<20	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	----	<20	----
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	<100	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	----	----	----
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	<1	<1	15	<1	----
Toluene	108-88-3	2	µg/L	<2	<2	15	<2	----
Ethylbenzene	100-41-4	2	µg/L	<2	<2	15	<2	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	15	<2	----
ortho-Xylene	95-47-6	2	µg/L	<2	<2	15	<2	----
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	30	<2	----
^ Sum of BTEX	----	1	µg/L	<1	<1	75	<1	----
Naphthalene	91-20-3	5	µg/L	<5	<5	18	<5	----
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	65.8	64.2	----	----	----
<b>EP074S: VOC Surrogates</b>								



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				MC_MW01	MC_MW02	TS (5)	TB (2)	----
				16-DEC-2013 15:50	16-DEC-2013 16:36	16-DEC-2013 15:00	16-DEC-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1327570-006	ES1327570-007	ES1327570-008	ES1327570-009	----
<b>EP074S: VOC Surrogates - Continued</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	110	98.6	----	----	----
Toluene-D8	2037-26-5	0.1	%	116	123	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	110	112	----	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	22.1	36.0	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	45.6	70.8	----	----	----
2,4,6-Tribromophenol	118-79-6	0.1	%	55.1	102	----	----	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	39.7	68.5	----	----	----
Anthracene-d10	1719-06-8	0.1	%	63.3	94.2	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	72.3	95.6	----	----	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	114	112	114	115	----
Toluene-D8	2037-26-5	0.1	%	114	107	115	129	----
4-Bromofluorobenzene	460-00-4	0.1	%	118	113	111	107	----



## Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP066S: PCB Surrogate</b>			
Decachlorobiphenyl	2051-24-3	28.5	129
<b>EP074S: VOC Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	78.3	133.2
Toluene-D8	2037-26-5	79.1	128.9
4-Bromofluorobenzene	460-00-4	80.8	123.7
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	10.0	44
2-Chlorophenol-D4	93951-73-6	14	94
2,4,6-Tribromophenol	118-79-6	17	125
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27.4	113
4-Terphenyl-d14	1718-51-0	32	112
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

## QUALITY CONTROL REPORT

Work Order	: <b>ES1327570</b>	Page	: 1 of 23
Client	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
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E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: 0207423 SYMPHONY - MT PIPER	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: MT PIPER	Date Samples Received	: 17-DEC-2013
C-O-C number	: 09787	Issue Date	: 30-DEC-2013
Sampler	: T.SHAW	No. of samples received	: 9
Order number	: ----	No. of samples analysed	: 9
Quote number	: SY/551/13 V4		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :  
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
RPD = Relative Percentage Difference  
# = Indicates failed QC



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

## Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Hoa Nguyen	Senior Inorganic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Organics





## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>ED037P: Alkalinity by PC Titrator (QC Lot: 3219751)</b>									
ES1327568-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	112	116	4.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	112	116	4.1	0% - 20%
ES1327568-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	201	189	6.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	201	189	6.3	0% - 20%
<b>ED037P: Alkalinity by PC Titrator (QC Lot: 3219754)</b>									
ES1327570-005	MA_MW12	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	63	62	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	63	62	0.0	0% - 20%
ES1327604-010	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	49	50	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	49	50	0.0	0% - 20%
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3219724)</b>									
ES1327568-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	419	418	0.4	0% - 20%
ES1327570-002	D01_161213_TB	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	176	176	0.0	0% - 20%
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3219767)</b>									
ES1327569-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	18	18	0.0	0% - 50%
<b>ED045G: Chloride Discrete analyser (QC Lot: 3219726)</b>									
ES1327568-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	52	52	0.0	0% - 20%
ES1327570-002	D01_161213_TB	ED045G: Chloride	16887-00-6	1	mg/L	10	11	0.0	0% - 50%
<b>ED045G: Chloride Discrete analyser (QC Lot: 3219765)</b>									
ES1327518-021	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	7	5	30.1	No Limit
ES1327569-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	14	15	0.0	0% - 50%
<b>ED093F: Dissolved Major Cations (QC Lot: 3219725)</b>									
ES1327568-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	93	93	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	48	48	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	81	81	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	10	10	0.0	0% - 50%
ES1327570-004	MA_MW01	ED093F: Calcium	7440-70-2	1	mg/L	21	21	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	20	21	0.0	0% - 20%



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>ED093F: Dissolved Major Cations (QC Lot: 3219725) - continued</b>									
ES1327570-004	MA_MW01	ED093F: Sodium	7440-23-5	1	mg/L	38	39	3.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	5	5	0.0	No Limit
<b>ED093F: Dissolved Major Cations (QC Lot: 3219766)</b>									
ES1327543-005	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
ES1327821-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	5	5	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	3	3	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	10	10	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	1	1	0.0	No Limit
<b>EG020F: Dissolved Metals by ICP-MS (QC Lot: 3223788)</b>									
ES1327568-002	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	6.92	7.26	4.9	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.014	0.015	0.0	0% - 50%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.016	0.015	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.0	No Limit
ES1327571-002	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	0.020	0.022	9.1	0% - 20%
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.909	1.05	14.4	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.017	0.019	9.7	0% - 50%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.041	0.045	9.3	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.0	No Limit
<b>EG035F: Dissolved Mercury by FIMS (QC Lot: 3223787)</b>									
ES1327568-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1327570-005	MA_MW12	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
<b>EG051G: Ferrous Iron by Discrete Analyser (QC Lot: 3219859)</b>									
ES1327568-001	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	15.3	16.2	5.8	0% - 20%
ES1327570-001	MA_MW07	EG051G: Ferrous Iron	----	0.05	mg/L	2.34	2.33	0.0	0% - 20%
<b>EG051G: Ferrous Iron by Discrete Analyser (QC Lot: 3221562)</b>									



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG051G: Ferrous Iron by Discrete Analyser (QC Lot: 3221562) - continued</b>									
ES1327538-007	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	6.11	6.83	11.1	0% - 20%
ES1327647-002	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	9.43	8.80	6.9	0% - 50%
<b>EK040P: Fluoride by PC Titrator (QC Lot: 3219753)</b>									
ES1327568-001	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.0	No Limit
ES1327568-004	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.0	No Limit
<b>EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 3220883)</b>									
ES1327787-005	Anonymous	EP066: Total Polychlorinated biphenyls	----	1	µg/L	<1	<1	0.0	No Limit
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3223596)</b>									
ES1327570-001	MA_MW07	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
ES1327571-002	Anonymous	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
<b>EP074B: Oxygenated Compounds (QC Lot: 3223596)</b>									
ES1327570-001	MA_MW07	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
ES1327571-002	Anonymous	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
<b>EP074C: Sulfonated Compounds (QC Lot: 3223596)</b>									
ES1327570-001	MA_MW07	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
ES1327571-002	Anonymous	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
<b>EP074D: Fumigants (QC Lot: 3223596)</b>									



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report							
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)		
<b>EP074D: Fumigants (QC Lot: 3223596) - continued</b>											
ES1327570-001	MA_MW07	EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit		
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit		
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit		
ES1327571-002	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit		
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit		
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit		
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3223596)</b>											
ES1327570-001	MA_MW07	EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit		
		EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit		
		EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit		
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit		
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit		
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit		
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit		
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit		
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit		
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit		
		ES1327571-002	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3223596) - continued</b>									
ES1327571-002	Anonymous	EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit		
EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit		
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit		
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3223596)</b>									
ES1327570-001	MA_MW07	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
ES1327571-002	Anonymous	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3223596) - continued</b>									
ES1327571-002	Anonymous	EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
<b>EP074G: Trihalomethanes (QC Lot: 3223596)</b>									
ES1327570-001	MA_MW07	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
ES1327571-002	Anonymous	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
<b>EP074H: Naphthalene (QC Lot: 3223596)</b>									
ES1327570-001	MA_MW07	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit
ES1327571-002	Anonymous	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3220885)</b>									
ES1327787-005	Anonymous	EP075(SIM): Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	0.0	No Limit
		ES1327787-007	Anonymous	EP075(SIM): Phenol	108-95-2	1.0	µg/L	<1.0	<1.0
EP075(SIM): 2-Chlorophenol	95-57-8			1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): 2-Methylphenol	95-48-7			1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): 2-Nitrophenol	88-75-5			1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): 2.4-Dimethylphenol	105-67-9			1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): 2.4-Dichlorophenol	120-83-2			1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): 2.6-Dichlorophenol	87-65-0			1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7			1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2			1.0	µg/L	<1.0	<1.0	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3220885) - continued</b>									
ES1327787-007	Anonymous	EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	0.0	No Limit
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3220885)</b>									
ES1327787-005	Anonymous	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Naphthalene	91-20-3	1.0	µg/L	12.6	13.0	3.5	0% - 50%
		EP075(SIM): Acenaphthylene	208-96-8	1.0	µg/L	1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	1.0	µg/L	2.0	1.9	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	1.0	µg/L	4.5	4.3	4.2	No Limit
		EP075(SIM): Phenanthrene	85-01-8	1.0	µg/L	5.4	4.4	21.0	No Limit
		EP075(SIM): Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Indeno(1,2,3-cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit		
ES1327787-007	Anonymous	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Indeno(1,2,3-cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit		
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3220884)</b>									
ES1327787-005	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	320	330	3.5	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	460	470	3.6	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit





Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3220884) - continued</b>										
ES1327787-007	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.0	No Limit	
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit	
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3223591)</b>										
ES1327455-005	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	480	560	14.7	0% - 20%	
ES1327455-011	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	5090	5420	6.4	0% - 20%	
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3223597)</b>										
ES1327570-001	MA_MW07	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit	
ES1327571-002	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3220884)</b>										
ES1327787-005	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	610	640	5.4	No Limit	
		EP071: >C16 - C34 Fraction	----	100	µg/L	140	140	0.0	No Limit	
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit	
ES1327787-007	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	0.0	No Limit	
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit	
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3223591)</b>										
ES1327455-005	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	590	680	13.8	0% - 20%	
ES1327455-011	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	5330	5680	6.4	0% - 20%	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3223597)</b>										
ES1327570-001	MA_MW07	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit	
ES1327571-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit	
<b>EP080: BTEXN (QC Lot: 3223591)</b>										
ES1327455-005	Anonymous	EP080: Benzene	71-43-2	1	µg/L	69	77	10.7	0% - 20%	
		EP080: Toluene	108-88-3	2	µg/L	5	6	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	24	27	11.0	0% - 50%	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	82	89	8.5	0% - 20%	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2	µg/L	31	34	9.7	0% - 50%	
ES1327455-011	Anonymous	EP080: Naphthalene	91-20-3	5	µg/L	11	13	21.3	No Limit	
		EP080: Benzene	71-43-2	1	µg/L	904	912	1.0	0% - 20%	
		EP080: Toluene	108-88-3	2	µg/L	1130	1120	1.2	0% - 20%	
		EP080: Ethylbenzene	100-41-4	2	µg/L	134	135	1.1	0% - 20%	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	551	585	5.9	0% - 20%	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2	µg/L	215	225	4.5	0% - 20%	
		EP080: Naphthalene	91-20-3	5	µg/L	32	29	12.0	No Limit	
<b>EP080: BTEXN (QC Lot: 3223597)</b>										
ES1327570-001	MA_MW07	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit	

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 Work Order : ES1327570  
 Client : ENVIRO RESOURCES MANAGEMENT  
 Project : 0207423 SYMPHONY - MT PIPER



Sub-Matrix: <b>WATER</b>				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP080: BTEXN (QC Lot: 3223597) - continued</b>									
ES1327570-001	MA_MW07	EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
ES1327571-002	Anonymous	EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit



### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>ED037P: Alkalinity by PC Titrator (QCLot: 3219751)</b>									
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	----	200 mg/L	90.7	81	111	
<b>ED037P: Alkalinity by PC Titrator (QCLot: 3219754)</b>									
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	----	200 mg/L	90.4	81	111	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3219724)</b>									
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	106	86	122	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3219767)</b>									
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	105	86	122	
<b>ED045G: Chloride Discrete analyser (QCLot: 3219726)</b>									
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	96.0	77	123	
<b>ED045G: Chloride Discrete analyser (QCLot: 3219765)</b>									
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	94.3	77	123	
<b>ED093F: Dissolved Major Cations (QCLot: 3219725)</b>									
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	87	113	
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.0	89	113	
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	105	79	113	
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	108	87	115	
<b>ED093F: Dissolved Major Cations (QCLot: 3219766)</b>									
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	87	113	
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	104	89	113	
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	86.8	79	113	
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.6	87	115	
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3223788)</b>									
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	91.5	80	118	
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	93.8	82	112	
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	95.1	81	111	
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	92.5	80	112	
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	93.6	83	111	
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	92.3	81	113	
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	92.4	81	113	
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	90.2	73	125	
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	93.5	80	116	
EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.1 mg/L	102	69	123	
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3223787)</b>									



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3223787) - continued</b>									
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	94.6	78	114	
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3219859)</b>									
EG051G: Ferrous Iron	----	0.10	mg/L	<0.10	2.00 mg/L	103	89	113	
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3221562)</b>									
EG051G: Ferrous Iron	----	0.10	mg/L	<0.10	2.00 mg/L	96.9	89	113	
<b>EK040P: Fluoride by PC Titrator (QCLot: 3219753)</b>									
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5.0 mg/L	98.6	75	119	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3220883)</b>									
EP066: Total Polychlorinated biphenyls	----	1	µg/L	<1	10 µg/L	78.0	61.6	107	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3220889)</b>									
EP066: Total Polychlorinated biphenyls	----	1	µg/L	<1	10 µg/L	81.0	61.6	107	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3223596)</b>									
EP074: Styrene	100-42-5	5	µg/L	<5	10 µg/L	96.9	74	118	
EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	10 µg/L	106	75	121	
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	10 µg/L	108	67	123	
EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	10 µg/L	105	70	122	
EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	10 µg/L	110	69	123	
EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	10 µg/L	105	71	121	
EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	10 µg/L	105	70	122	
EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	10 µg/L	113	67	123	
EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	10 µg/L	114	62	126	
<b>EP074B: Oxygenated Compounds (QCLot: 3223596)</b>									
EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	100 µg/L	94.6	61.4	134	
EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	100 µg/L	87.3	73.6	130	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	100 µg/L	87.4	61	139	
EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	100 µg/L	87.3	65	137	
<b>EP074C: Sulfonated Compounds (QCLot: 3223596)</b>									
EP074: Carbon disulfide	75-15-0	5	µg/L	<5	10 µg/L	102	72.8	127	
<b>EP074D: Fumigants (QCLot: 3223596)</b>									
EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	10 µg/L	100	61	119	
EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	10 µg/L	97.1	76	120	
EP074: cis-1.3-Dichloropropylene	10061-01-5	10	µg/L	<10	10 µg/L	84.6	62	120	
EP074: trans-1.3-Dichloropropylene	10061-02-6	10	µg/L	<10	10 µg/L	84.8	61	119	
EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	10 µg/L	92.0	69	117	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3223596)</b>									
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	100 µg/L	74.1	60.6	138	
EP074: Chloromethane	74-87-3	50	µg/L	<50	100 µg/L	90.7	67.4	130	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3223596) - continued</b>									
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	100 µg/L	80.9	69.4	129	
EP074: Bromomethane	74-83-9	50	µg/L	<50	100 µg/L	112	56	140	
EP074: Chloroethane	75-00-3	50	µg/L	<50	100 µg/L	124	63	135	
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	100 µg/L	115	65	131	
EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	10 µg/L	107	69	123	
EP074: Iodomethane	74-88-4	5	µg/L	<5	10 µg/L	106	70.2	128	
EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	10 µg/L	97.1	71	119	
EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	10 µg/L	101	75	119	
EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	10 µg/L	99.6	77	117	
EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	10 µg/L	99.4	61	119	
EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	10 µg/L	104	73	119	
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	10 µg/L	97.0	63	121	
EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	10 µg/L	98.8	78	122	
EP074: Trichloroethene	79-01-6	5	µg/L	<5	10 µg/L	102	74	120	
EP074: Dibromomethane	74-95-3	5	µg/L	<5	10 µg/L	89.4	74	118	
EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	10 µg/L	98.2	75	123	
EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	10 µg/L	98.4	79	121	
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	10 µg/L	101	72	124	
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	10 µg/L	92.2	66	114	
EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	10 µg/L	93.8	60	120	
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	10 µg/L	98.6	70.6	128	
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	10 µg/L	90.7	70	124	
EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	10 µg/L	88.6	74	128	
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	10 µg/L	85.2	71.8	126	
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	10 µg/L	81.8	66.4	136	
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	10 µg/L	120	58	132	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3223596)</b>									
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	10 µg/L	102	80	118	
EP074: Bromobenzene	108-86-1	5	µg/L	<5	10 µg/L	102	76	116	
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	10 µg/L	107	71	121	
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	10 µg/L	102	71	121	
EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	10 µg/L	107	74	120	
EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	10 µg/L	106	72	120	
EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	10 µg/L	102	77	117	
EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	10 µg/L	110	60	126	
EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	10 µg/L	108	67	125	
<b>EP074G: Trihalomethanes (QCLot: 3223596)</b>									
EP074: Chloroform	67-66-3	5	µg/L	<5	10 µg/L	97.1	76	118	
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	10 µg/L	87.9	64	118	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074G: Trihalomethanes (QCLot: 3223596) - continued</b>									
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	10 µg/L	83.6	65	115	
EP074: Bromoform	75-25-2	5	µg/L	<5	10 µg/L	88.8	73.5	126	
<b>EP074H: Naphthalene (QCLot: 3223596)</b>									
EP074: Naphthalene	91-20-3	7	µg/L	<7	10 µg/L	86.8	61	125	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3220885)</b>									
EP075(SIM): Phenol	108-95-2	0.2	µg/L	----	5 µg/L	38.0	24.5	61.9	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Chlorophenol	95-57-8	0.2	µg/L	----	5 µg/L	77.4	63.8	110	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Methylphenol	95-48-7	0.2	µg/L	----	5 µg/L	96.8	55.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	0.4	µg/L	----	10 µg/L	67.6	42.5	114	
		2	µg/L	<2.0	----	----	----	----	
EP075(SIM): 2-Nitrophenol	88-75-5	0.2	µg/L	----	5 µg/L	83.7	62.7	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.2	µg/L	----	5 µg/L	99.2	59.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.2	µg/L	----	5 µg/L	90.1	59.3	122	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.2	µg/L	----	5 µg/L	91.9	64.3	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.2	µg/L	----	5 µg/L	92.3	63	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.2	µg/L	----	5 µg/L	93.8	58.7	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.2	µg/L	----	5 µg/L	95.1	50	108	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Pentachlorophenol	87-86-5	0.4	µg/L	----	10 µg/L	56.7	8.7	95	
		2	µg/L	<2.0	----	----	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3220888)</b>									
EP075(SIM): Phenol	108-95-2	0.2	µg/L	----	5 µg/L	36.6	24.5	61.9	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Chlorophenol	95-57-8	0.2	µg/L	----	5 µg/L	70.4	63.8	110	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Methylphenol	95-48-7	0.2	µg/L	----	5 µg/L	67.2	55.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	0.4	µg/L	----	10 µg/L	60.7	42.5	114	
		2	µg/L	<2.0	----	----	----	----	
EP075(SIM): 2-Nitrophenol	88-75-5	0.2	µg/L	----	5 µg/L	89.4	62.7	117	
		1	µg/L	<1.0	----	----	----	----	



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3220888) - continued</b>									
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.2	µg/L	----	5 µg/L	79.6	59.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.2	µg/L	----	5 µg/L	70.4	59.3	122	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.2	µg/L	----	5 µg/L	70.7	64.3	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.2	µg/L	----	5 µg/L	71.8	63	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.2	µg/L	----	5 µg/L	76.8	58.7	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.2	µg/L	----	5 µg/L	76.3	50	108	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Pentachlorophenol	87-86-5	0.4	µg/L	----	10 µg/L	67.9	8.7	95	
		2	µg/L	<2.0	----	----	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3220885)</b>									
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	5 µg/L	87.3	58.6	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	5 µg/L	92.1	63.6	114	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	5 µg/L	87.9	62.2	113	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	5 µg/L	90.7	63.9	115	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	5 µg/L	84.4	62.6	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	5 µg/L	89.1	64.3	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	5 µg/L	89.9	63.6	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	5 µg/L	94.0	63.1	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	5 µg/L	92.0	64.1	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	5 µg/L	88.5	62.5	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	5 µg/L	94.9	61.7	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	5 µg/L	83.5	61.7	117	
		1	µg/L	<1.0	----	----	----	----	





Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3220885) - continued</b>									
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	5 µg/L	95.0	63.3	117	
		0.5	µg/L	<0.5	----	----	----	----	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	5 µg/L	88.7	59.9	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	----	5 µg/L	90.5	61.2	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	----	5 µg/L	79.0	59.1	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	1	µg/L	<1.0	----	----	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3220888)</b>									
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	5 µg/L	68.2	58.6	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	5 µg/L	75.5	63.6	114	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	5 µg/L	69.0	62.2	113	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	5 µg/L	74.5	63.9	115	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	5 µg/L	72.4	62.6	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	5 µg/L	70.9	64.3	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	5 µg/L	80.5	63.6	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	5 µg/L	78.3	63.1	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	5 µg/L	79.9	64.1	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	5 µg/L	75.3	62.5	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	5 µg/L	74.7	61.7	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	5 µg/L	85.8	61.7	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	5 µg/L	79.8	63.3	117	
		0.5	µg/L	<0.5	----	----	----	----	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	5 µg/L	77.9	59.9	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	----	5 µg/L	79.4	61.2	117	
		1	µg/L	<1.0	----	----	----	----	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
						LCS	Low	High
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3220888) - continued</b>								
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	----	5 µg/L	82.6	59.1	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	1	µg/L	<1.0	----	----	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3220884)</b>								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	80.8	59	129
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	91.2	71	131
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	76.4	62	120
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3220887)</b>								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	81.7	59	129
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	126	71	131
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	84.5	62	120
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3223591)</b>								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	99.5	75	127
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3223597)</b>								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	116	75	127
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3220884)</b>								
EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	2500 µg/L	77.8	58.9	131
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	108	73.9	138
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
		50	µg/L	----	1500 µg/L	86.9	67	127
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3220887)</b>								
EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	2500 µg/L	82.6	58.9	131
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	114	73.9	138
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
		50	µg/L	----	1500 µg/L	80.7	67	127
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3223591)</b>								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	99.5	75	127
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3223597)</b>								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	117	75	127
<b>EP080: BTEXN (QCLot: 3223591)</b>								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	103	70	124
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	96.8	65	129
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	99.8	70	120
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	96.3	69	121
	106-42-3							
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	98.9	72	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	102	70	124
<b>EP080: BTEXN (QCLot: 3223597)</b>								



Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit		Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High
<b>EP080: BTEXN (QCLot: 3223597) - continued</b>								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	110	70	124
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	113	65	129
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	112	70	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	104	69	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	106	72	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	105	70	124

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: WATER				Matrix Spike (MS) Report			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%) Low High	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3219724)</b>							
ES1327568-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3219767)</b>							
ES1327569-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	84.4	70	130
<b>ED045G: Chloride Discrete analyser (QCLot: 3219726)</b>							
ES1327568-001	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	94.5	70	130
<b>ED045G: Chloride Discrete analyser (QCLot: 3219765)</b>							
ES1327518-021	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	93.2	70	130
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3223788)</b>							
ES1327568-002	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	112	70	130
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	117	70	130
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	112	70	130
		EG020A-F: Copper	7440-50-8	0.2 mg/L	116	70	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	110	70	130
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	# Not Determined	70	130
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	110	70	130
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	116	70	130
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3223787)</b>							
ES1327568-001	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	88.5	70	130
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3219859)</b>							



Sub-Matrix: WATER

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3219859) - continued</b>							
ES1327568-001	Anonymous	EG051G: Ferrous Iron	----	1.00 mg/L	# Not Determined	68	128
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3221562)</b>							
ES1327538-007	Anonymous	EG051G: Ferrous Iron	----	1.00 mg/L	# Not Determined	68	128
<b>EK040P: Fluoride by PC Titrator (QCLot: 3219753)</b>							
ES1327568-001	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	113	70	130
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3220883)</b>							
ES1327787-006	Anonymous	EP066: Total Polychlorinated biphenyls	----	10 µg/L	78.0	70	130
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3223596)</b>							
ES1327570-001	MA_MW07	EP074: 1,1-Dichloroethene	75-35-4	25 µg/L	97.1	70	130
		EP074: Trichloroethene	79-01-6	25 µg/L	116	70	130
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3223596)</b>							
ES1327570-001	MA_MW07	EP074: Chlorobenzene	108-90-7	25 µg/L	127	70	130
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3220885)</b>							
ES1327787-006	Anonymous	EP075(SIM): Phenol	108-95-2	20 µg/L	28.8	20	130
		EP075(SIM): 2-Chlorophenol	95-57-8	20 µg/L	81.5	60	130
		EP075(SIM): 2-Nitrophenol	88-75-5	20 µg/L	71.7	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	20 µg/L	85.1	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	20 µg/L	86.5	20	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3220885)</b>							
ES1327787-006	Anonymous	EP075(SIM): Acenaphthene	83-32-9	20 µg/L	78.1	70	130
		EP075(SIM): Pyrene	129-00-0	20 µg/L	72.1	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3220884)</b>							
ES1327787-006	Anonymous	EP071: C10 - C14 Fraction	----	200 µg/L	119	74	150
		EP071: C15 - C28 Fraction	----	300 µg/L	126	77	153
		EP071: C29 - C36 Fraction	----	200 µg/L	87.1	67	153
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3223591)</b>							
ES1327455-005	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	110	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3223597)</b>							
ES1327570-001	MA_MW07	EP080: C6 - C9 Fraction	----	325 µg/L	114	70	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3220884)</b>							
ES1327787-006	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	250 µg/L	113	74	150
		EP071: >C16 - C34 Fraction	----	350 µg/L	95.6	77	153
		EP071: >C34 - C40 Fraction	----	150 µg/L	133	67	153



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report				
				Spike	Spike Recovery(%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3223591)</b>								
ES1327455-005	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	108	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3223597)</b>								
ES1327570-001	MA_MW07	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	115	70	130	
<b>EP080: BTEXN (QCLot: 3223591)</b>								
ES1327455-005	Anonymous	EP080: Benzene	71-43-2	25 µg/L	84.8	70	130	
		EP080: Toluene	108-88-3	25 µg/L	83.3	70	130	
		EP080: Ethylbenzene	100-41-4	25 µg/L	111	70	130	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	91.6	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	25 µg/L	108	70	130	
	EP080: Naphthalene	91-20-3	25 µg/L	90.0	70	130		
<b>EP080: BTEXN (QCLot: 3223597)</b>								
ES1327570-001	MA_MW07	EP080: Benzene	71-43-2	25 µg/L	114	70	130	
		EP080: Toluene	108-88-3	25 µg/L	113	70	130	
		EP080: Ethylbenzene	100-41-4	25 µg/L	114	70	130	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	110	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	25 µg/L	113	70	130	
	EP080: Naphthalene	91-20-3	25 µg/L	109	70	130		

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
					Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3219724)</b>											
ES1327568-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	----	70	130	----	----	
<b>ED045G: Chloride Discrete analyser (QCLot: 3219726)</b>											
ES1327568-001	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	94.5	----	70	130	----	----	
<b>EK040P: Fluoride by PC Titrator (QCLot: 3219753)</b>											
ES1327568-001	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	113	----	70	130	----	----	
<b>ED045G: Chloride Discrete analyser (QCLot: 3219765)</b>											
ES1327518-021	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	93.2	----	70	130	----	----	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3219767)</b>											



Sub-Matrix: **WATER**

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3219767) - continued</b>										
ES1327569-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	84.4	----	70	130	----	----
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3219859)</b>										
ES1327568-001	Anonymous	EG051G: Ferrous Iron	----	1.00 mg/L	# Not Determined	----	68	128	----	----
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3220883)</b>										
ES1327787-006	Anonymous	EP066: Total Polychlorinated biphenyls	----	10 µg/L	78.0	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3220884)</b>										
ES1327787-006	Anonymous	EP071: C10 - C14 Fraction	----	200 µg/L	119	----	74	150	----	----
		EP071: C15 - C28 Fraction	----	300 µg/L	126	----	77	153	----	----
		EP071: C29 - C36 Fraction	----	200 µg/L	87.1	----	67	153	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3220884)</b>										
ES1327787-006	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	250 µg/L	113	----	74	150	----	----
		EP071: >C16 - C34 Fraction	----	350 µg/L	95.6	----	77	153	----	----
		EP071: >C34 - C40 Fraction	----	150 µg/L	133	----	67	153	----	----
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3220885)</b>										
ES1327787-006	Anonymous	EP075(SIM): Phenol	108-95-2	20 µg/L	28.8	----	20	130	----	----
		EP075(SIM): 2-Chlorophenol	95-57-8	20 µg/L	81.5	----	60	130	----	----
		EP075(SIM): 2-Nitrophenol	88-75-5	20 µg/L	71.7	----	60	130	----	----
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	20 µg/L	85.1	----	70	130	----	----
		EP075(SIM): Pentachlorophenol	87-86-5	20 µg/L	86.5	----	20	130	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3220885)</b>										
ES1327787-006	Anonymous	EP075(SIM): Acenaphthene	83-32-9	20 µg/L	78.1	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	20 µg/L	72.1	----	70	130	----	----
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3221562)</b>										
ES1327538-007	Anonymous	EG051G: Ferrous Iron	----	1.00 mg/L	# Not Determined	----	68	128	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3223591)</b>										
ES1327455-005	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	110	----	70	130	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3223591)</b>										
ES1327455-005	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	108	----	70	130	----	----
<b>EP080: BTEXN (QCLot: 3223591)</b>										
ES1327455-005	Anonymous	EP080: Benzene	71-43-2	25 µg/L	84.8	----	70	130	----	----
		EP080: Toluene	108-88-3	25 µg/L	83.3	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	25 µg/L	111	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	91.6	----	70	130	----	----
		EP080: ortho-Xylene	106-42-3 95-47-6	25 µg/L	108	----	70	130	----	----



Sub-Matrix: **WATER**

Laboratory sample ID					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report										
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)					
						MS	MSD	Low	High	Value	Control Limit				
<b>EP080: BTEXN (QCLot: 3223591) - continued</b>					ES1327455-005	Anonymous	EP080: Naphthalene	91-20-3	25 µg/L	90.0	----	70	130	----	----
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3223596)</b>					ES1327570-001	MA_MW07	EP074: 1,1-Dichloroethene	75-35-4	25 µg/L	97.1	----	70	130	----	----
							EP074: Trichloroethene	79-01-6	25 µg/L	116	----	70	130	----	----
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3223596)</b>					ES1327570-001	MA_MW07	EP074: Chlorobenzene	108-90-7	25 µg/L	127	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3223597)</b>					ES1327570-001	MA_MW07	EP080: C6 - C9 Fraction	----	325 µg/L	114	----	70	130	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3223597)</b>					ES1327570-001	MA_MW07	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	115	----	70	130	----	----
<b>EP080: BTEXN (QCLot: 3223597)</b>					ES1327570-001	MA_MW07	EP080: Benzene	71-43-2	25 µg/L	114	----	70	130	----	----
							EP080: Toluene	108-88-3	25 µg/L	113	----	70	130	----	----
							EP080: Ethylbenzene	100-41-4	25 µg/L	114	----	70	130	----	----
							EP080: meta- & para-Xylene	108-38-3	25 µg/L	110	----	70	130	----	----
								106-42-3							
							EP080: ortho-Xylene	95-47-6	25 µg/L	113	----	70	130	----	----
							EP080: Naphthalene	91-20-3	25 µg/L	109	----	70	130	----	----
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3223787)</b>					ES1327568-001	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	88.5	----	70	130	----	----
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3223788)</b>					ES1327568-002	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	112	----	70	130	----	----
							EG020A-F: Cadmium	7440-43-9	0.05 mg/L	117	----	70	130	----	----
							EG020A-F: Chromium	7440-47-3	0.2 mg/L	112	----	70	130	----	----
							EG020A-F: Copper	7440-50-8	0.2 mg/L	116	----	70	130	----	----
							EG020A-F: Lead	7439-92-1	0.2 mg/L	110	----	70	130	----	----
							EG020A-F: Manganese	7439-96-5	0.2 mg/L	# Not Determined	----	70	130	----	----
							EG020A-F: Nickel	7440-02-0	0.2 mg/L	110	----	70	130	----	----
							EG020A-F: Zinc	7440-66-6	0.2 mg/L	116	----	70	130	----	----



## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1327570</b>	Page	: 1 of 11
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: 0207423 SYMPHONY - MT PIPER	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: MT PIPER	Date Samples Received	: 17-DEC-2013
C-O-C number	: 09787	Issue Date	: 30-DEC-2013
Sampler	: T.SHAW	No. of samples received	: 9
Order number	: ----	No. of samples analysed	: 9
Quote number	: SY/551/13 V4		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER** Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>ED037P: Alkalinity by PC Titrator</b>								
<b>Clear Plastic Bottle - Natural (ED037-P)</b> MA_MW07, ML_MW12, MA_MW12, MC_MW02	D01_161213_TB, MA_MW01, MC_MW01,	16-DEC-2013	---	30-DEC-2013	----	19-DEC-2013	30-DEC-2013	✓
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
<b>Clear Plastic Bottle - Natural (ED041G)</b> MA_MW07, ML_MW12, MA_MW12, MC_MW02	D01_161213_TB, MA_MW01, MC_MW01,	16-DEC-2013	---	13-JAN-2014	----	18-DEC-2013	13-JAN-2014	✓
<b>ED045G: Chloride Discrete analyser</b>								
<b>Clear Plastic Bottle - Natural (ED045G)</b> MA_MW07, ML_MW12, MA_MW12, MC_MW02	D01_161213_TB, MA_MW01, MC_MW01,	16-DEC-2013	---	13-JAN-2014	----	18-DEC-2013	13-JAN-2014	✓
<b>ED093F: Dissolved Major Cations</b>								
<b>Clear Plastic Bottle - Natural (ED093F)</b> MA_MW07, ML_MW12, MA_MW12, MC_MW02	D01_161213_TB, MA_MW01, MC_MW01,	16-DEC-2013	---	23-DEC-2013	----	18-DEC-2013	23-DEC-2013	✓
<b>EG020F: Dissolved Metals by ICP-MS</b>								
<b>Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F)</b> D01_161213_TB, MA_MW01, MC_MW01,	ML_MW12, MA_MW12, MC_MW02	16-DEC-2013	---	14-JUN-2014	----	21-DEC-2013	14-JUN-2014	✓
<b>Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F)</b> MA_MW07		17-DEC-2013	---	15-JUN-2014	----	21-DEC-2013	15-JUN-2014	✓



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EG035F: Dissolved Mercury by FIMS</b>							
Clear Plastic Bottle - Filtered; Lab-acidified (EG035F) D01_161213_TB, ML_MW12, MA_MW01, MA_MW12, MC_MW01, MC_MW02	16-DEC-2013	---	13-JAN-2014	----	23-DEC-2013	13-JAN-2014	✓
Clear Plastic Bottle - Filtered; Lab-acidified (EG035F) MA_MW07	17-DEC-2013	---	14-JAN-2014	----	23-DEC-2013	14-JAN-2014	✓
<b>EG051G: Ferrous Iron by Discrete Analyser</b>							
Clear Plastic Bottle - HCl - Filtered (EG051G) MA_MW07, ML_MW12, MA_MW01, MA_MW12	16-DEC-2013	----	----	----	18-DEC-2013	23-DEC-2013	✓
Clear Plastic Bottle - HCl - Filtered (EG051G) MC_MW01	16-DEC-2013	----	----	----	19-DEC-2013	23-DEC-2013	✓
Clear Plastic Bottle - Natural (EG051G) MC_MW02	16-DEC-2013	----	----	----	18-DEC-2013	17-DEC-2013	*
<b>EK040P: Fluoride by PC Titrator</b>							
Clear Plastic Bottle - Natural (EK040P) MA_MW07, D01_161213_TB, ML_MW12, MA_MW01, MA_MW12, MC_MW01, MC_MW02	16-DEC-2013	---	13-JAN-2014	----	19-DEC-2013	13-JAN-2014	✓
<b>EP066: Polychlorinated Biphenyls (PCB)</b>							
Amber Glass Bottle - Unpreserved (EP066) MA_MW07, D01_161213_TB, ML_MW12, MA_MW01, MA_MW12, MC_MW01	16-DEC-2013	19-DEC-2013	23-DEC-2013	✓	20-DEC-2013	29-JAN-2014	✓
Amber Glass Bottle - Unpreserved (EP066) MC_MW02	16-DEC-2013	23-DEC-2013	23-DEC-2013	✓	27-DEC-2013	05-FEB-2014	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>							
Amber Glass Bottle - Unpreserved (EP071) MA_MW07, D01_161213_TB, ML_MW12, MA_MW01, MA_MW12, MC_MW01	16-DEC-2013	19-DEC-2013	23-DEC-2013	✓	20-DEC-2013	29-JAN-2014	✓
Amber Glass Bottle - Unpreserved (EP071) MC_MW02	16-DEC-2013	23-DEC-2013	23-DEC-2013	✓	27-DEC-2013	05-FEB-2014	✓
<b>EP074D: Fumigants</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MA_MW07, D01_161213_TB, ML_MW12, MA_MW01, MA_MW12, MC_MW01, MC_MW02	16-DEC-2013	22-DEC-2013	30-DEC-2013	✓	22-DEC-2013	30-DEC-2013	✓



Matrix: **WATER** Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP074E: Halogenated Aliphatic Compounds</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> MA_MW07, ML_MW12, MA_MW12, MC_MW02	D01_161213_TB, MA_MW01, MC_MW01,	16-DEC-2013	22-DEC-2013	30-DEC-2013	✓	22-DEC-2013	30-DEC-2013	✓
<b>EP074F: Halogenated Aromatic Compounds</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> MA_MW07, ML_MW12, MA_MW12, MC_MW02	D01_161213_TB, MA_MW01, MC_MW01,	16-DEC-2013	22-DEC-2013	30-DEC-2013	✓	22-DEC-2013	30-DEC-2013	✓
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> MA_MW07, ML_MW12, MA_MW12, MC_MW02	D01_161213_TB, MA_MW01, MC_MW01,	16-DEC-2013	22-DEC-2013	30-DEC-2013	✓	22-DEC-2013	30-DEC-2013	✓
<b>EP074H: Naphthalene</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> MA_MW07, ML_MW12, MA_MW12, MC_MW02	D01_161213_TB, MA_MW01, MC_MW01,	16-DEC-2013	22-DEC-2013	30-DEC-2013	✓	22-DEC-2013	30-DEC-2013	✓
<b>EP074B: Oxygenated Compounds</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> MA_MW07, ML_MW12, MA_MW12, MC_MW02	D01_161213_TB, MA_MW01, MC_MW01,	16-DEC-2013	22-DEC-2013	30-DEC-2013	✓	22-DEC-2013	30-DEC-2013	✓
<b>EP074C: Sulfonated Compounds</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> MA_MW07, ML_MW12, MA_MW12, MC_MW02	D01_161213_TB, MA_MW01, MC_MW01,	16-DEC-2013	22-DEC-2013	30-DEC-2013	✓	22-DEC-2013	30-DEC-2013	✓
<b>EP074G: Trihalomethanes</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> MA_MW07, ML_MW12, MA_MW12, MC_MW02	D01_161213_TB, MA_MW01, MC_MW01,	16-DEC-2013	22-DEC-2013	30-DEC-2013	✓	22-DEC-2013	30-DEC-2013	✓



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP075(SIM)A: Phenolic Compounds</b>								
<b>Amber Glass Bottle - Unpreserved (EP075(SIM))</b> MA_MW07, ML_MW12, MA_MW12,	D01_161213_TB, MA_MW01, MC_MW01	16-DEC-2013	19-DEC-2013	23-DEC-2013	✓	20-DEC-2013	29-JAN-2014	✓
<b>Amber Glass Bottle - Unpreserved (EP075(SIM))</b> MC_MW02		16-DEC-2013	23-DEC-2013	23-DEC-2013	✓	27-DEC-2013	05-FEB-2014	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
<b>Amber Glass Bottle - Unpreserved (EP075(SIM))</b> MA_MW07, ML_MW12, MA_MW12,	D01_161213_TB, MA_MW01, MC_MW01	16-DEC-2013	19-DEC-2013	23-DEC-2013	✓	20-DEC-2013	29-JAN-2014	✓
<b>Amber Glass Bottle - Unpreserved (EP075(SIM))</b> MC_MW02		16-DEC-2013	23-DEC-2013	23-DEC-2013	✓	27-DEC-2013	05-FEB-2014	✓
<b>EP080: BTEXN</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MA_MW07, ML_MW12, MA_MW12, MC_MW02	D01_161213_TB, MA_MW01, MC_MW01,	16-DEC-2013	22-DEC-2013	30-DEC-2013	✓	22-DEC-2013	30-DEC-2013	✓
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> TS (5),	TB (2)	16-DEC-2013	23-DEC-2013	30-DEC-2013	✓	23-DEC-2013	30-DEC-2013	✓
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MA_MW07, ML_MW12, MA_MW12, MC_MW02	D01_161213_TB, MA_MW01, MC_MW01,	16-DEC-2013	22-DEC-2013	30-DEC-2013	✓	22-DEC-2013	30-DEC-2013	✓
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> TB (2)		16-DEC-2013	23-DEC-2013	30-DEC-2013	✓	23-DEC-2013	30-DEC-2013	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: ✘ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Alkalinity by PC Titrator	ED037-P	4	40	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	4	36	11.1	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	2	19	10.5	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	4	40	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	2	20	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	4	36	11.1	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	2	20	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	14	7.1	10.0	✘	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	3	23	13.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	20	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	4	37	10.8	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	20	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
Alkalinity by PC Titrator	ED037-P	2	40	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	4	36	11.1	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	19	5.3	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	2	40	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	36	5.6	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	2	32	6.3	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	2	20	10.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	23	8.7	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	32	6.3	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	37	5.4	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
Chloride by Discrete Analyser	ED045G	2	36	5.6	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	19	5.3	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	2	40	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	36	5.6	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	2	32	6.3	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	2	20	10.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



Matrix: **WATER** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Method Blanks (MB) - Continued</b>							
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	23	8.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	32	6.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	37	5.4	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
Chloride by Discrete Analyser	ED045G	2	36	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	14	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	23	8.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	37	5.4	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement





## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Sulfate (Turbidimetric) as SO <sub>4</sub> <sup>2-</sup> by Discrete Analyser	ED041G	WATER	APHA 21st ed., 4500-SO <sub>4</sub> Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> <sup>2-</sup> concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Chloride by Discrete Analyser	ED045G	WATER	APHA 21st ed., 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	Major Cations is determined based on APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um filtered sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Hardness parameters are calculated based on APHA 21st ed., 2340 B. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): Samples are 0.45 um filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) Samples are 0.45 um filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Ferrous Iron by Discrete Analyser	EG051G	WATER	APHA 21st ed., 3500 Fe-B. A colorimetric determination based on the reaction between phenanthroline and ferrous iron at pH 3.2-3.3 to form an orange-red complex that is measured against a five-point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Fluoride by PC Titrator	EK040P	WATER	APHA 21st ed., 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)



Analytical Methods	Method	Matrix	Method Descriptions
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by Turbi SO4 by DA. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Polychlorinated Biphenyls (PCB)	EP066	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
TPH - Semivolatle Fraction	EP071	WATER	USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Volatile Organic Compounds	EP074	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
TPH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
Lab Acidification of Dissolved Metals	EN80F	WATER	US EPA Method 200.8
Separatory Funnel Extraction of Liquids	ORG14	WATER	USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.



## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Matrix Spike (MS) Recoveries</b>							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	ES1327568-001	Anonymous	Sulfate as SO4 - Turbidimetric	14808-79-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG020F: Dissolved Metals by ICP-MS	ES1327568-002	Anonymous	Manganese	7439-96-5	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG051G: Ferrous Iron by Discrete Analyser	ES1327538-007	Anonymous	Ferrous Iron	----	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG051G: Ferrous Iron by Discrete Analyser	ES1327568-001	Anonymous	Ferrous Iron	----	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.

#### Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

Matrix: **WATER**

Method	Extraction / Preparation			Analysis			
	Container / Client Sample ID(s)	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
<b>EG051G: Ferrous Iron by Discrete Analyser</b>							
Clear Plastic Bottle - Natural MC_MW02		----	----	----	18-DEC-2013	17-DEC-2013	1

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

Matrix: **WATER**

Page : 11 of 11  
 Work Order : ES1327570  
 Client : ENVIRO RESOURCES MANAGEMENT  
 Project : 0207423 SYMPHONY - MT PIPER



Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
<b>Laboratory Duplicates (DUP)</b>					
Polychlorinated Biphenyls (PCB)	1	14	7.1	10.0	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

<b>Work Order</b>	: <b>ES1327570</b>		
<b>Client</b>	: <b>ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: MR JONATHAN LEKAWSKI	<b>Contact</b>	: Barbara Hanna
<b>Address</b>	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: jonathan.lekawski@erm.com	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: 0207423 SYMPHONY - MT PIPER	<b>Page</b>	: 1 of 3
<b>Order number</b>	: ----		
<b>C-O-C number</b>	: 09787	<b>Quote number</b>	: ES2013ENVRES0360 (SY/551/13 V4)
<b>Site</b>	: MT PIPER		
<b>Sampler</b>	: T.SHAW	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement

#### Dates

<b>Date Samples Received</b>	: 17-DEC-2013	<b>Issue Date</b>	: 18-DEC-2013 19:15
<b>Client Requested Due Date</b>	: 30-DEC-2013	<b>Scheduled Reporting Date</b>	: <b>30-DEC-2013</b>

#### Delivery Details

<b>Mode of Delivery</b>	: Carrier	<b>Temperature</b>	: 4.1°C - Ice present
<b>No. of coolers/boxes</b>	: 1 HARD	<b>No. of samples received</b>	: 9
<b>Security Seal</b>	: Intact.	<b>No. of samples analysed</b>	: 9

#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Sample containers do not comply to pretreatment / preservation standards (AS, APHA, USEPA). Please refer to the Sample Container(s)/Preservation Non-Compliance Log at the end of this report for details.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Ferrous bottle not received for sample D01, unable to conduct ferrous iron analysis.**
- **Sample T01\_161213\_TS to be forwarded to Envrolab.**
- **Green bottle received labelled for ferrous iron analysis for sample MC\_MW02.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

Method	Sample Container Received	Preferred Sample Container for Analysis
<b>EG051G : Ferrous Iron by Discrete Analyser</b>		
<b>MC_MW02</b>	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - HCl - Filtered

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EG020F Dissolved Metals by ICPMS	WATER - EG051G Ferrous Iron by Discrete Analyser	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP066-PCB-WA Polychlorinated Biphenyls (PCB)	WATER - EP074 (water) Volatile Organic Compounds	WATER - EP080 BTEXN	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02A Major Anions (Chloride, Sulphate, Fluoride,
ES1327570-001	16-DEC-2013 11:20	MA_MW07		✓	✓	✓	✓		✓	✓
	17-DEC-2013 15:00	MA_MW07	✓							
ES1327570-002	16-DEC-2013 11:20	D01_161213_TB	✓		✓	✓	✓		✓	✓
ES1327570-003	16-DEC-2013 12:20	ML_MW12	✓	✓	✓	✓	✓		✓	✓
ES1327570-004	16-DEC-2013 14:05	MA_MW01	✓	✓	✓	✓	✓		✓	✓
ES1327570-005	16-DEC-2013 15:00	MA_MW12	✓	✓	✓	✓	✓		✓	✓
ES1327570-006	16-DEC-2013 15:50	MC_MW01	✓	✓	✓	✓	✓		✓	✓
ES1327570-007	16-DEC-2013 16:36	MC_MW02	✓	✓	✓	✓	✓		✓	✓
ES1327570-008	16-DEC-2013 15:00	TS (5)						✓		

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - W-18 TRH(C6 - C9)/BTEXN	WATER - W-27 TRH/BTEXN/PAH/Phenols/8 Metals
ES1327570-001	16-DEC-2013 11:20	MA_MW07		✓
	17-DEC-2013 15:00	MA_MW07		✓
ES1327570-002	16-DEC-2013 11:20	D01_161213_TB		✓
ES1327570-003	16-DEC-2013 12:20	ML_MW12		✓
ES1327570-004	16-DEC-2013 14:05	MA_MW01		✓
ES1327570-005	16-DEC-2013 15:00	MA_MW12		✓
ES1327570-006	16-DEC-2013 15:50	MC_MW01		✓
ES1327570-007	16-DEC-2013 16:36	MC_MW02		✓
ES1327570-009	16-DEC-2013 15:00	TB (2)	✓	

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
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Email jonathan.lekawski@erm.com

### SYMPHONY ERARING

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email Symphony.Eraring@erm.com  
Email Symphony.Eraring@erm.com  
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Email Symphony.Eraring@erm.com  
Email Symphony.Eraring@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com





- Sydney
- Melbourne
- Brisbane
- Perth
- Hunter Valley
- North Coast
- Other

Grand Floor, 33 Saunders Street, Pyrmont, NSW, 2009. (ph) 02 8584 8888 (fax) 02 8584 8800  
 Level 3, Yarra Tower, WTC, 18-38 Sturtley Street, Docklands, VIC, 3005. (ph) 03 9696 8011 (fax) 03 9696 8022  
 Level 1, 60 Leichhardt Street, Spring Hill, QLD, 4004. (ph) 07 3839 8393 (fax) 07 3839 8381  
 Level 6, Grain Pool Bld, 172 St Georges Tce, WA, 6850. (ph) 08 9321 5200 (fax) 08 9321 5262  
 53 Bonville Avenue, Thornton, NSW, 2322. (ph) 02 4964 2150 (fax) 02 4964 2152  
 Suite 3/146 Gordon Street, Port Macquarie, NSW, 2444. (ph) 02 8584 7155 (fax) 02 8584 7160

Project No: 0207423  
 Project Name: Project Symphony-MT Paper  
 Project Location: Mt Piper  
 Project Manager: Jonathan LeKauski  
 Sampler: Thavone Swan

COC Number: A 09787  
 Laboratory: ALS

General Analysis Requirements

- 1. Turn Around Time (please tick):  1 Day  2 Days  3 Days  Normal (TAT)
- 2. Do you wish any sediment layers in water to be excluded from extractions?
- 3. Additional QA/QC reported where sample batches are < 10 samples?
- 4. % of extraneous material removed from samples to be reported as per NIEPM 5.1.1?

Laboratory Number	Sample ID	Sample Depth	Sample Date	Sample Time	Matrix			Preservation			Containers (number/vol)	BTEX	TPH (C6-C9 P & T) + TPH (C10-C36)	Speciated TPH	VOC Scan (USEPA 8260 List)	SVOC Scan (USEPA 8270 List)	OC OP Pesticides	PAH	Phenols	PCB	Metals* (dissolved / total)	Other Comments on sample (eg: high voc, highly contaminated, special detection limits etc etc)
					Soil	Water	Other	Ice	Acid	Filter												
1	MA-MW07	4.5	16/12/13	11:20	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	NO PROUS iron bottle. Please forward to environmental lab.
2	MA-MW07	8.5	16/12/13	11:20	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	NO PROUS iron bottle. Please forward to environmental lab.
3	MA-MW12	8m	12/26	11:20	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
4	MA-MW01	4.5	14/05	15:00	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
5	MA-MW01	5.2	15/00	15:50	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
6	MC-MW01	4.8	16/36	16:36	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
7	MC-MW02	4.5	16/36	16:36	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
8	TS(5)	-	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Filtered water in plastic bottle for ferrus iron
9	TR(2)	-	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

Comments: VOTS = including cationised lignosulphonates  
 Major cations + anions including sulfate + chloride.  
 ALS quote: SY/SS/13 V4

Relinquished by: Thavone Swan  
 Signed: [Signature]  
 Date/Time: 16/12/13 / 18:30

Received by: Steven  
 Signed: [Signature]  
 Date/Time: 17/12/13 11:10

Environmental Division  
 Sydney  
 Work Order  
**ES1327570**  
 Telephone: +61-2-8784 8555

\*Metals (circle)  
 As Cd Cr Cu Hg Ni Pb Zn & B, Mn, Se, Zn, Ferrus iron

## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>ES1327849</b> <b>Amendment</b> : <b>1</b> <b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : SYMPHONY DELTAWEST <b>Address</b> : GRND FLOOR, 33 SAUNDERS STREET PYRMONT NSW AUSTRALIA 2009  <b>E-mail</b> : symphony.deltawest@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800 <b>Project</b> : SYMPHONY-DELTA WEST <b>Order number</b> : 0207420/0207423 <b>C-O-C number</b> : ---- <b>Sampler</b> : CF <b>Site</b> : ----  <b>Quote number</b> : SY/551/13 V4	<b>Page</b> : 1 of 11  <b>Laboratory</b> : Environmental Division Sydney <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164  <b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555 <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement  <b>Date Samples Received</b> : 19-DEC-2013 <b>Issue Date</b> : 28-JAN-2014  <b>No. of samples received</b> : 7 <b>No. of samples analysed</b> : 7
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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Organics
Raymond Commodor	Instrument Chemist	Sydney Inorganics



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## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
^ = This result is computed from individual analyte detections at or above the level of reporting

- **This report has been amended and re-released to allow the reporting of additional analytical data namely Manganese and Selenium via EG020-F analysis for samples MH\_MW01, MF\_MW01, and MH\_MW03.**



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MH_MW01	MF_MW01	MF_MW02	MG_X_MP1	MH_MW03
				17-DEC-2013 15:00	17-DEC-2013 16:32	17-DEC-2013 15:03	17-DEC-2013 13:30	17-DEC-2013 11:14
Compound	CAS Number	LOR	Unit	ES1327849-001	ES1327849-002	ES1327849-003	ES1327849-004	ES1327849-005
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	92	59	124	15	81
Total Alkalinity as CaCO3	----	1	mg/L	92	59	124	15	81
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1070	68	71	666	2000
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	68	12	24	52	335
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	168	13	33	149	254
Magnesium	7439-95-4	1	mg/L	104	9	20	29	207
Sodium	7440-23-5	1	mg/L	208	29	21	128	540
Potassium	7440-09-7	1	mg/L	27	7	10	23	48
<b>EG020F: Dissolved Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	0.001	0.002	----	----	0.001
Cadmium	7440-43-9	0.0001	mg/L	0.0008	<0.0001	----	----	0.0006
Chromium	7440-47-3	0.001	mg/L	0.002	<0.001	----	----	<0.001
Copper	7440-50-8	0.001	mg/L	0.004	0.001	----	----	0.002
Lead	7439-92-1	0.001	mg/L	<0.001	0.001	----	----	0.002
Manganese	7439-96-5	0.001	mg/L	7.16	1.32	----	----	20.6
Nickel	7440-02-0	0.001	mg/L	0.312	0.069	----	----	0.990
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	----	----	<0.01
Zinc	7440-66-6	0.005	mg/L	0.440	0.034	----	----	0.802
Boron	7440-42-8	0.05	mg/L	0.15	<0.05	----	----	2.16
<b>EG035F: Dissolved Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
<b>EG051G: Ferrous Iron by Discrete Analyser</b>								
Ferrous Iron	----	0.05	mg/L	0.86	2.19	7.81	26.1	34.9
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS</b>								
Selenium	7782-49-2	0.2	µg/L	----	----	<0.2	1.0	----
Arsenic	7440-38-2	0.2	µg/L	----	----	0.4	0.6	----
Boron	7440-42-8	5	µg/L	----	----	21	289	----
Cadmium	7440-43-9	0.05	µg/L	----	----	<0.05	5.30	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MH_MW01	MF_MW01	MF_MW02	MG_X_MP1	MH_MW03
				17-DEC-2013 15:00	17-DEC-2013 16:32	17-DEC-2013 15:03	17-DEC-2013 13:30	17-DEC-2013 11:14
Compound	CAS Number	LOR	Unit	ES1327849-001	ES1327849-002	ES1327849-003	ES1327849-004	ES1327849-005
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS - Continued</b>								
Chromium	7440-47-3	0.2	µg/L	----	----	<0.2	0.2	----
Copper	7440-50-8	0.5	µg/L	----	----	2.5	39.4	----
Lead	7439-92-1	0.1	µg/L	----	----	0.6	2.7	----
Manganese	7439-96-5	0.5	µg/L	----	----	1220	1760	----
Nickel	7440-02-0	0.5	µg/L	----	----	35.7	172	----
Zinc	7440-66-6	1	µg/L	----	----	56	427	----
<b>EK040P: Fluoride by PC Titrator</b>								
Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.1	0.2	<0.1
<b>EN055: Ionic Balance</b>								
Total Anions	----	0.01	meq/L	26.0	2.93	4.63	15.6	52.7
Total Cations	----	0.01	meq/L	26.7	2.83	4.46	16.0	54.4
Ionic Balance	----	0.01	%	1.22	----	1.87	1.11	1.59
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MH_MW01	MF_MW01	MF_MW02	MG_X_MP1	MH_MW03
				17-DEC-2013 15:00	17-DEC-2013 16:32	17-DEC-2013 15:03	17-DEC-2013 13:30	17-DEC-2013 11:14
Compound	CAS Number	LOR	Unit	ES1327849-001	ES1327849-002	ES1327849-003	ES1327849-004	ES1327849-005
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MH_MW01	MF_MW01	MF_MW02	MG_X_MP1	MH_MW03
				17-DEC-2013 15:00	17-DEC-2013 16:32	17-DEC-2013 15:03	17-DEC-2013 13:30	17-DEC-2013 11:14
Compound	CAS Number	LOR	Unit	ES1327849-001	ES1327849-002	ES1327849-003	ES1327849-004	ES1327849-005
<b>EP080: BTEXN - Continued</b>								
Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	30.7	20.4	20.3	16.6	19.8
2-Chlorophenol-D4	93951-73-6	0.1	%	79.7	34.3	51.6	29.8	48.1
2,4,6-Tribromophenol	118-79-6	0.1	%	107	43.7	66.1	42.0	64.8
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	99.2	43.7	71.4	40.5	66.7
Anthracene-d10	1719-06-8	0.1	%	95.2	49.4	78.2	45.3	75.1
4-Terphenyl-d14	1718-51-0	0.1	%	98.7	38.2	79.9	46.7	82.3
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	104	113	113	113	115
Toluene-D8	2037-26-5	0.1	%	113	122	124	124	123
4-Bromofluorobenzene	460-00-4	0.1	%	98.8	110	112	110	110





## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				D01_171213CF	RB01_171213CF	---	---	---
				17-DEC-2013 15:00	17-DEC-2013 15:00	---	---	---
Compound	CAS Number	LOR	Unit	ES1327849-006	ES1327849-007	---	---	---
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	---	---	---	---
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	---	---	---	---
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	106	---	---	---	---
Total Alkalinity as CaCO3	---	1	mg/L	106	---	---	---	---
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1030	---	---	---	---
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	68	---	---	---	---
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	166	---	---	---	---
Magnesium	7439-95-4	1	mg/L	101	---	---	---	---
Sodium	7440-23-5	1	mg/L	204	---	---	---	---
Potassium	7440-09-7	1	mg/L	26	---	---	---	---
<b>EG020T: Total Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	---	<0.001	---	---	---
Cadmium	7440-43-9	0.0001	mg/L	---	<0.0001	---	---	---
Chromium	7440-47-3	0.001	mg/L	---	<0.001	---	---	---
Copper	7440-50-8	0.001	mg/L	---	<0.001	---	---	---
Lead	7439-92-1	0.001	mg/L	---	<0.001	---	---	---
Nickel	7440-02-0	0.001	mg/L	---	<0.001	---	---	---
Zinc	7440-66-6	0.005	mg/L	---	<0.005	---	---	---
<b>EG035F: Dissolved Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	---	---	---	---
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	---	<0.0001	---	---	---
<b>EG051G: Ferrous Iron by Discrete Analyser</b>								
Ferrous Iron	---	0.05	mg/L	0.86	---	---	---	---
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS</b>								
Selenium	7782-49-2	0.2	µg/L	<0.2	---	---	---	---
Arsenic	7440-38-2	0.2	µg/L	<0.2	---	---	---	---
Boron	7440-42-8	5	µg/L	171	---	---	---	---
Cadmium	7440-43-9	0.05	µg/L	0.66	---	---	---	---
Chromium	7440-47-3	0.2	µg/L	<0.2	---	---	---	---



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				D01_171213CF	RB01_171213CF	---	---	---
				17-DEC-2013 15:00	17-DEC-2013 15:00	---	---	---
Compound	CAS Number	LOR	Unit	ES1327849-006	ES1327849-007	---	---	---
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS - Continued</b>								
Copper	7440-50-8	0.5	µg/L	1.6	---	---	---	---
Lead	7439-92-1	0.1	µg/L	0.7	---	---	---	---
Manganese	7439-96-5	0.5	µg/L	6650	---	---	---	---
Nickel	7440-02-0	0.5	µg/L	348	---	---	---	---
Zinc	7440-66-6	1	µg/L	396	---	---	---	---
<b>EK040P: Fluoride by PC Titrator</b>								
Fluoride	16984-48-8	0.1	mg/L	<0.1	---	---	---	---
<b>EN055: Ionic Balance</b>								
Total Anions	---	0.01	meq/L	25.5	---	---	---	---
Total Cations	---	0.01	meq/L	26.1	---	---	---	---
Ionic Balance	---	0.01	%	1.26	---	---	---	---
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	---	---	---
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	---	---	---
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	---	---	---
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	---	---	---
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	---	---	---
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	---	---	---
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	---	---	---
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	---	---	---
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	---	---	---
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	---	---	---
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	---	---	---
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	---	---	---
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	---	---	---
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	---	---	---
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	---	---	---
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	---	---	---
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	---	---	---
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	---	---	---
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	---	---	---
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	---	---	---



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				D01_171213CF	RB01_171213CF	---	---	---
				17-DEC-2013 15:00	17-DEC-2013 15:00	---	---	---
Compound	CAS Number	LOR	Unit	ES1327849-006	ES1327849-007	---	---	---
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	---	---	---
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	---	---	---
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	---	---	---
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	---	---	---
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	---	---	---
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	---	---	---
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	---	---	---
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	---	---	---
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	---	---	---
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	---	---	---
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	20	µg/L	<20	<20	---	---	---
C10 - C14 Fraction	----	50	µg/L	<50	<50	---	---	---
C15 - C28 Fraction	----	100	µg/L	<100	<100	---	---	---
C29 - C36 Fraction	----	50	µg/L	<50	<50	---	---	---
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	---	---	---
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	---	---	---
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	---	---	---
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	---	---	---
>C16 - C34 Fraction	----	100	µg/L	<100	<100	---	---	---
>C34 - C40 Fraction	----	100	µg/L	<100	<100	---	---	---
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	---	---	---
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	---	---	---
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	<1	<1	---	---	---
Toluene	108-88-3	2	µg/L	<2	<2	---	---	---
Ethylbenzene	100-41-4	2	µg/L	<2	<2	---	---	---
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	---	---	---
ortho-Xylene	95-47-6	2	µg/L	<2	<2	---	---	---
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	---	---	---
^ Sum of BTEX	----	1	µg/L	<1	<1	---	---	---



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				D01_171213CF	RB01_171213CF	----	----	----
				17-DEC-2013 15:00	17-DEC-2013 15:00	----	----	----
Compound	CAS Number	LOR	Unit	ES1327849-006	ES1327849-007	----	----	----
<b>EP080: BTEXN - Continued</b>								
Naphthalene	91-20-3	5	µg/L	<5	<5	----	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	21.2	19.1	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	55.6	49.4	----	----	----
2,4,6-Tribromophenol	118-79-6	0.1	%	69.4	60.0	----	----	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	73.9	62.9	----	----	----
Anthracene-d10	1719-06-8	0.1	%	79.7	72.1	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	84.8	77.7	----	----	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	115	114	----	----	----
Toluene-D8	2037-26-5	0.1	%	120	119	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	108	107	----	----	----



## Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP075(SIM): Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	10.0	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
<b>EP075(SIM): PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27.4	113
4-Terphenyl-d14	1718-51-0	32	112
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

## QUALITY CONTROL REPORT

<b>Work Order</b>	: <b>ES1327849</b>	Page	: 1 of 12
<b>Amendment</b>	: <b>1</b>		
<b>Client</b>	: <b>ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: SYMPHONY DELTAWEST	<b>Contact</b>	: Barbara Hanna
<b>Address</b>	: GRND FLOOR, 33 SAUNDERS STREET PYRMONT NSW AUSTRALIA 2009	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: symphony.deltawest@erm.com	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: SYMPHONY-DELTA WEST	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b>	: ----		
<b>C-O-C number</b>	: ----	<b>Date Samples Received</b>	: 19-DEC-2013
<b>Sampler</b>	: CF	<b>Issue Date</b>	: 28-JAN-2014
<b>Order number</b>	: 0207420/0207423		
<b>Quote number</b>	: SY/551/13 V4	<b>No. of samples received</b>	: 7
		<b>No. of samples analysed</b>	: 7

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



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Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Organics
Raymond Commodor	Instrument Chemist	Sydney Inorganics



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### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :            Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
                  CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
                  LOR = Limit of reporting  
                  RPD = Relative Percentage Difference  
                  # = Indicates failed QC





## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>ED037P: Alkalinity by PC Titrator (QC Lot: 3225573)</b>									
ES1327849-001	MH_MW01	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	92	90	2.9	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	92	90	2.9	0% - 20%
ES1327850-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	216	226	4.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	216	226	4.6	0% - 20%
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3227253)</b>									
ES1327849-001	MH_MW01	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1070	1070	0.2	0% - 20%
ES1327850-006	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	140	138	0.9	0% - 20%
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3229847)</b>									
ES1327849-002	MF_MW01	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	68	67	0.0	0% - 20%
ES1328100-008	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	220	237	7.5	0% - 20%
<b>ED045G: Chloride Discrete analyser (QC Lot: 3227252)</b>									
ES1327849-001	MH_MW01	ED045G: Chloride	16887-00-6	1	mg/L	68	69	1.6	0% - 20%
ES1327850-006	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	33	34	0.0	0% - 20%
<b>ED045G: Chloride Discrete analyser (QC Lot: 3229845)</b>									
ES1327849-002	MF_MW01	ED045G: Chloride	16887-00-6	1	mg/L	12	11	0.0	0% - 50%
ES1328100-008	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	420	420	0.0	0% - 20%
<b>ED093F: Dissolved Major Cations (QC Lot: 3227251)</b>									
ES1327849-001	MH_MW01	ED093F: Calcium	7440-70-2	1	mg/L	168	168	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	104	103	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	208	208	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	27	27	0.0	0% - 20%
ES1327850-007	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	84	82	2.1	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	55	54	1.8	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	16	16	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	36	36	0.0	0% - 20%
<b>ED093F: Dissolved Major Cations (QC Lot: 3229846)</b>									
ES1328116-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	14	11	21.6	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	10	9	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	528	461	13.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	5	4	25.5	No Limit
ES1328190-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	47	47	0.0	0% - 20%



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>ED093F: Dissolved Major Cations (QC Lot: 3229846) - continued</b>									
ES1328190-001	Anonymous	ED093F: Magnesium	7439-95-4	1	mg/L	13	13	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	4	4	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	4	4	0.0	No Limit
<b>EG020T: Total Metals by ICP-MS (QC Lot: 3225860)</b>									
ES1327732-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.009	0.009	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.007	0.007	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.306	0.329	7.1	0% - 20%
ES1327935-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.0142	0.0138	2.7	0% - 50%
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.116	0.111	5.0	0% - 50%
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.096	0.093	3.6	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	224	205	8.8	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.666	0.664	0.3	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.694	0.673	3.0	0% - 20%
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	2.46	2.24	9.6	0% - 20%
<b>EG035F: Dissolved Mercury by FIMS (QC Lot: 3225662)</b>									
EP1309662-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1327849-003	MF_MW02	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3228806)</b>									
ES1327849-007	RB01_171213CF	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
<b>EG051G: Ferrous Iron by Discrete Analyser (QC Lot: 3225725)</b>									
ES1327849-001	MH_MW01	EG051G: Ferrous Iron	----	0.05	mg/L	0.86	0.88	2.6	0% - 50%
<b>EG051G: Ferrous Iron by Discrete Analyser (QC Lot: 3229113)</b>									
ES1327849-002	MF_MW01	EG051G: Ferrous Iron	----	0.05	mg/L	2.19	2.18	0.5	0% - 20%
ES1327850-007	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	<0.05	0.06	25.6	No Limit
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 3228350)</b>									
ES1327849-003	MF_MW02	EG094A-F: Cadmium	7440-43-9	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EG094A-F: Lead	7439-92-1	0.1	µg/L	0.6	0.6	0.0	No Limit
		EG094A-F: Arsenic	7440-38-2	0.2	µg/L	0.4	0.4	0.0	No Limit
		EG094A-F: Chromium	7440-47-3	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG094A-F: Copper	7440-50-8	0.5	µg/L	2.5	2.5	0.0	No Limit
		EG094A-F: Manganese	7439-96-5	0.5	µg/L	1220	1190	1.9	0% - 20%
		EG094A-F: Nickel	7440-02-0	0.5	µg/L	35.7	35.4	0.7	0% - 20%
		EG094A-F: Zinc	7440-66-6	1	µg/L	56	56	0.0	0% - 20%
		EG094A-F: Boron	7440-42-8	5	µg/L	21	21	0.0	No Limit
ES1327850-007	Anonymous	EG094A-F: Cadmium	7440-43-9	0.05	µg/L	<0.05	<0.05	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 3228350) - continued</b>										
ES1327850-007	Anonymous	EG094A-F: Lead	7439-92-1	0.1	µg/L	<0.1	<0.1	0.0	No Limit	
		EG094A-F: Arsenic	7440-38-2	0.2	µg/L	0.7	0.7	0.0	No Limit	
		EG094A-F: Chromium	7440-47-3	0.2	µg/L	<0.2	<0.2	0.0	No Limit	
		EG094A-F: Copper	7440-50-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit	
		EG094A-F: Manganese	7439-96-5	0.5	µg/L	705	709	0.6	0% - 20%	
		EG094A-F: Nickel	7440-02-0	0.5	µg/L	4.1	4.1	0.0	No Limit	
		EG094A-F: Zinc	7440-66-6	1	µg/L	4	4	0.0	No Limit	
		EG094A-F: Boron	7440-42-8	5	µg/L	23	24	0.0	No Limit	
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 3228351)</b>										
ES1327849-003	MF_MW02	EG094B-F: Selenium	7782-49-2	0.2	µg/L	<0.2	<0.2	0.0	No Limit	
ES1327850-007	Anonymous	EG094B-F: Selenium	7782-49-2	0.2	µg/L	<0.2	<0.2	0.0	No Limit	
<b>EK040P: Fluoride by PC Titrator (QC Lot: 3225574)</b>										
ES1327849-001	MH_MW01	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit	
ES1327850-004	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.3	0.3	0.0	No Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3226326)</b>										
ES1327849-001	MH_MW01	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit	
ES1327849-002	MF_MW01	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3226326)</b>										
ES1327849-001	MH_MW01	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit	
ES1327849-002	MF_MW01	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit	
<b>EP080: BTEXN (QC Lot: 3226326)</b>										
ES1327849-001	MH_MW01	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit	
ES1327849-002	MF_MW01	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit	
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit	
			106-42-3							
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit			
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit	



### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>ED037P: Alkalinity by PC Titrator (QCLot: 3225573)</b>									
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	----	200 mg/L	89.8	81	111	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3227253)</b>									
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	100	86	122	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3229847)</b>									
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	102	86	122	
<b>ED045G: Chloride Discrete analyser (QCLot: 3227252)</b>									
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	95.6	77	123	
<b>ED045G: Chloride Discrete analyser (QCLot: 3229845)</b>									
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	96.8	77	123	
<b>ED093F: Dissolved Major Cations (QCLot: 3227251)</b>									
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	103	87	113	
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	89	113	
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	104	79	113	
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	104	87	115	
<b>ED093F: Dissolved Major Cations (QCLot: 3229846)</b>									
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	106	87	113	
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	104	89	113	
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	110	79	113	
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	104	87	115	
<b>EG020T: Total Metals by ICP-MS (QCLot: 3225860)</b>									
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	91.7	79	121	
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	88.8	82	114	
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.4	83	115	
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	96.1	83	117	
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	90.2	85	115	
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	101	83	117	
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	88.5	76	118	
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3225662)</b>									
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	92.4	78	114	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3228806)</b>									
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	103	77	115	
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3225725)</b>									
EG051G: Ferrous Iron	----	0.10	mg/L	<0.10	2.00 mg/L	104	89	113	



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3229113)</b>									
EG051G: Ferrous Iron	----	0.10	mg/L	<0.10	2.00 mg/L	101	89	113	
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3228350)</b>									
EG094A-F: Arsenic	7440-38-2	0.2	µg/L	<0.2	10 µg/L	97.2	75	129	
EG094A-F: Boron	7440-42-8	5	µg/L	<5	10 µg/L	108	79	129	
EG094A-F: Cadmium	7440-43-9	0.05	µg/L	<0.05	10 µg/L	96.8	78	112	
EG094A-F: Chromium	7440-47-3	0.2	µg/L	<0.2	10 µg/L	97.5	71	123	
EG094A-F: Copper	7440-50-8	0.5	µg/L	<0.5	10 µg/L	98.7	77	125	
EG094A-F: Lead	7439-92-1	0.1	µg/L	<0.1	10 µg/L	98.6	74	118	
EG094A-F: Manganese	7439-96-5	0.5	µg/L	<0.5	10 µg/L	97.5	79	119	
EG094A-F: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	104	72	128	
EG094A-F: Zinc	7440-66-6	1	µg/L	<1	10 µg/L	106	76	134	
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3228351)</b>									
EG094B-F: Selenium	7782-49-2	0.2	µg/L	<0.2	10 µg/L	107	75	125	
<b>EK040P: Fluoride by PC Titrator (QCLot: 3225574)</b>									
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5.0 mg/L	93.0	75	119	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3227310)</b>									
EP075(SIM): Phenol	108-95-2	0.2	µg/L	----	5 µg/L	39.7	24.5	61.9	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Chlorophenol	95-57-8	0.2	µg/L	----	5 µg/L	77.8	63.8	110	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Methylphenol	95-48-7	0.2	µg/L	----	5 µg/L	70.5	55.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	0.4	µg/L	----	10 µg/L	68.2	42.5	114	
		2	µg/L	<2.0	----	----	----	----	
EP075(SIM): 2-Nitrophenol	88-75-5	0.2	µg/L	----	5 µg/L	83.9	62.7	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.2	µg/L	----	5 µg/L	88.0	59.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.2	µg/L	----	5 µg/L	80.7	59.3	122	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.2	µg/L	----	5 µg/L	92.1	64.3	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.2	µg/L	----	5 µg/L	81.7	63	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.2	µg/L	----	5 µg/L	66.6	58.7	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.2	µg/L	----	5 µg/L	74.6	50	108	
		1	µg/L	<1.0	----	----	----	----	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3227310) - continued</b>									
EP075(SIM): Pentachlorophenol	87-86-5	0.4	µg/L	----	10 µg/L	48.2	8.7	95	
		2	µg/L	<2.0	----	----	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3227310)</b>									
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	5 µg/L	86.4	58.6	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	5 µg/L	64.4	63.6	114	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	5 µg/L	63.3	62.2	113	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	5 µg/L	# 63.4	63.9	115	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	5 µg/L	68.6	62.6	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	5 µg/L	70.1	64.3	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	5 µg/L	70.3	63.6	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	5 µg/L	67.3	63.1	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	5 µg/L	66.9	64.1	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	5 µg/L	78.0	62.5	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	5 µg/L	62.3	61.7	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	5 µg/L	81.2	61.7	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	5 µg/L	67.4	63.3	117	
		0.5	µg/L	<0.5	----	----	----	----	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	5 µg/L	63.5	59.9	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	----	5 µg/L	65.9	61.2	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	----	5 µg/L	66.7	59.1	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	1	µg/L	<1.0	----	----	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3226326)</b>									
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	116	75	127	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3227309)</b>									
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	93.9	59	129	



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	High
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3227309) - continued</b>									
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	93.0	71	131	
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	83.4	62	120	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3226326)</b>									
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	119	75	127	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3227309)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	2500 µg/L	104	58.9	131	
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	88.5	73.9	138	
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----	
		50	µg/L	----	1500 µg/L	102	67	127	
<b>EP080: BTEXN (QCLot: 3226326)</b>									
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	118	70	124	
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	108	65	129	
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	117	70	120	
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	119	69	121	
	106-42-3								
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	115	72	122	
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	115	70	124	

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%) MS	Recovery Limits (%)	
					Low	High	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3227253)</b>							
ES1327849-001	MH_MW01	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3229847)</b>							
ES1327849-002	MF_MW01	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130
<b>ED045G: Chloride Discrete analyser (QCLot: 3227252)</b>							
ES1327849-001	MH_MW01	ED045G: Chloride	16887-00-6	250 mg/L	96.4	70	130
<b>ED045G: Chloride Discrete analyser (QCLot: 3229845)</b>							
ES1327849-002	MF_MW01	ED045G: Chloride	16887-00-6	250 mg/L	96.2	70	130
<b>EG020T: Total Metals by ICP-MS (QCLot: 3225860)</b>							
ES1327745-001	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	97.4	70	130





Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EG020T: Total Metals by ICP-MS (QCLot: 3225860) - continued</b>							
ES1327745-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.25 mg/L	106	70	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	97.8	70	130
		EG020A-T: Copper	7440-50-8	1 mg/L	97.6	70	130
		EG020A-T: Lead	7439-92-1	1 mg/L	112	70	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	101	70	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	96.0	70	130
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3225662)</b>							
EP1309662-001	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	92.3	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3228806)</b>							
ES1327969-002	Anonymous	EG035T: Mercury	7439-97-6	0.010 mg/L	78.8	70	130
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3225725)</b>							
ES1327849-001	MH_MW01	EG051G: Ferrous Iron	----	1.00 mg/L	94.6	68	128
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3229113)</b>							
ES1327849-002	MF_MW01	EG051G: Ferrous Iron	----	1.00 mg/L	79.5	68	128
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3228350)</b>							
ES1327849-006	D01_171213CF	EG094A-F: Arsenic	7440-38-2	50 µg/L	122	70	130
		EG094A-F: Cadmium	7440-43-9	12.5 µg/L	101	70	130
		EG094A-F: Chromium	7440-47-3	50 µg/L	103	70	130
		EG094A-F: Copper	7440-50-8	50 µg/L	103	70	130
		EG094A-F: Lead	7439-92-1	50 µg/L	101	70	130
		EG094A-F: Manganese	7439-96-5	50 µg/L	# Not Determined	70	130
		EG094A-F: Nickel	7440-02-0	50 µg/L	# Not Determined	70	130
		EG094A-F: Zinc	7440-66-6	50 µg/L	# Not Determined	70	130
<b>EK040P: Fluoride by PC Titrator (QCLot: 3225574)</b>							
ES1327849-001	MH_MW01	EK040P: Fluoride	16984-48-8	5.0 mg/L	104	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3226326)</b>							
ES1327849-001	MH_MW01	EP080: C6 - C9 Fraction	----	325 µg/L	120	70	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3226326)</b>							
ES1327849-001	MH_MW01	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	121	70	130
<b>EP080: BTEXN (QCLot: 3226326)</b>							
ES1327849-001	MH_MW01	EP080: Benzene	71-43-2	25 µg/L	114	70	130
		EP080: Toluene	108-88-3	25 µg/L	98.5	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	114	70	130



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EP080: BTEXN (QCLot: 3226326) - continued</b>							
ES1327849-001	MH_MW01	EP080: meta- & para-Xylene	108-38-3	25 µg/L	112	70	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	25 µg/L	114	70	130
		EP080: Naphthalene	91-20-3	25 µg/L	119	70	130

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report							
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit	
<b>EK040P: Fluoride by PC Titrator (QCLot: 3225574)</b>											
ES1327849-001	MH_MW01	EK040P: Fluoride	16984-48-8	5.0 mg/L	104	----	70	130	----	----	
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3225662)</b>											
EP1309662-001	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	92.3	----	70	130	----	----	
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3225725)</b>											
ES1327849-001	MH_MW01	EG051G: Ferrous Iron	----	1.00 mg/L	94.6	----	68	128	----	----	
<b>EG020T: Total Metals by ICP-MS (QCLot: 3225860)</b>											
ES1327745-001	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	97.4	----	70	130	----	----	
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	106	----	70	130	----	----	
		EG020A-T: Chromium	7440-47-3	1 mg/L	97.8	----	70	130	----	----	
		EG020A-T: Copper	7440-50-8	1 mg/L	97.6	----	70	130	----	----	
		EG020A-T: Lead	7439-92-1	1 mg/L	112	----	70	130	----	----	
		EG020A-T: Nickel	7440-02-0	1 mg/L	101	----	70	130	----	----	
		EG020A-T: Zinc	7440-66-6	1 mg/L	96.0	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3226326)</b>											
ES1327849-001	MH_MW01	EP080: C6 - C9 Fraction	----	325 µg/L	120	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3226326)</b>											
ES1327849-001	MH_MW01	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	121	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3226326)</b>											
ES1327849-001	MH_MW01	EP080: Benzene	71-43-2	25 µg/L	114	----	70	130	----	----	
		EP080: Toluene	108-88-3	25 µg/L	98.5	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	25 µg/L	114	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	112	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	25 µg/L	114	----	70	130	----	----	
		EP080: Naphthalene	91-20-3	25 µg/L	119	----	70	130	----	----	



Sub-Matrix: **WATER**

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>ED045G: Chloride Discrete analyser (QCLot: 3227252)</b>										
ES1327849-001	MH_MW01	ED045G: Chloride	16887-00-6	250 mg/L	96.4	----	70	130	----	----
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3227253)</b>										
ES1327849-001	MH_MW01	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	----	70	130	----	----
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3228350)</b>										
ES1327849-006	D01_171213CF	EG094A-F: Arsenic	7440-38-2	50 µg/L	122	----	70	130	----	----
		EG094A-F: Cadmium	7440-43-9	12.5 µg/L	101	----	70	130	----	----
		EG094A-F: Chromium	7440-47-3	50 µg/L	103	----	70	130	----	----
		EG094A-F: Copper	7440-50-8	50 µg/L	103	----	70	130	----	----
		EG094A-F: Lead	7439-92-1	50 µg/L	101	----	70	130	----	----
		EG094A-F: Manganese	7439-96-5	50 µg/L	# Not Determined	----	70	130	----	----
		EG094A-F: Nickel	7440-02-0	50 µg/L	# Not Determined	----	70	130	----	----
		EG094A-F: Zinc	7440-66-6	50 µg/L	# Not Determined	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3228806)</b>										
ES1327969-002	Anonymous	EG035T: Mercury	7439-97-6	0.010 mg/L	78.8	----	70	130	----	----
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3229113)</b>										
ES1327849-002	MF_MW01	EG051G: Ferrous Iron	----	1.00 mg/L	79.5	----	68	128	----	----
<b>ED045G: Chloride Discrete analyser (QCLot: 3229845)</b>										
ES1327849-002	MF_MW01	ED045G: Chloride	16887-00-6	250 mg/L	96.2	----	70	130	----	----
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3229847)</b>										
ES1327849-002	MF_MW01	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	----	70	130	----	----

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1327849</b>	Page	: 1 of 11
Amendment	: <b>1</b>		
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: SYMPHONY DELTAWEST	Contact	: Barbara Hanna
Address	: GRND FLOOR, 33 SAUNDERS STREET PYRMONT NSW AUSTRALIA 2009	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: symphony.deltawest@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: SYMPHONY-DELTA WEST	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 19-DEC-2013
Sampler	: CF	Issue Date	: 28-JAN-2014
Order number	: 0207420/0207423		
Quote number	: SY/551/13 V4	No. of samples received	: 7
		No. of samples analysed	: 7

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>ED037P: Alkalinity by PC Titrator</b>								
<b>Clear Plastic Bottle - Natural (ED037-P)</b> MH_MW01, MF_MW02, MH_MW03,	MF_MW01, MG_X_MP1, D01_171213CF	17-DEC-2013	---	31-DEC-2013	----	21-DEC-2013	31-DEC-2013	✓
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
<b>Clear Plastic Bottle - Natural (ED041G)</b> MH_MW01, MH_MW03,	MG_X_MP1, D01_171213CF	17-DEC-2013	---	14-JAN-2014	----	23-DEC-2013	14-JAN-2014	✓
<b>Clear Plastic Bottle - Natural (ED041G)</b> MF_MW01,	MF_MW02	17-DEC-2013	---	14-JAN-2014	----	24-DEC-2013	14-JAN-2014	✓
<b>ED045G: Chloride Discrete analyser</b>								
<b>Clear Plastic Bottle - Natural (ED045G)</b> MH_MW01, MH_MW03,	MG_X_MP1, D01_171213CF	17-DEC-2013	---	14-JAN-2014	----	23-DEC-2013	14-JAN-2014	✓
<b>Clear Plastic Bottle - Natural (ED045G)</b> MF_MW01,	MF_MW02	17-DEC-2013	---	14-JAN-2014	----	24-DEC-2013	14-JAN-2014	✓
<b>ED093F: Dissolved Major Cations</b>								
<b>Clear Plastic Bottle - Natural (ED093F)</b> MH_MW01, MH_MW03,	MG_X_MP1, D01_171213CF	17-DEC-2013	---	24-DEC-2013	----	23-DEC-2013	24-DEC-2013	✓
<b>Clear Plastic Bottle - Natural (ED093F)</b> MF_MW01,	MF_MW02	17-DEC-2013	---	24-DEC-2013	----	24-DEC-2013	24-DEC-2013	✓
<b>EG020F: Dissolved Metals by ICP-MS</b>								
<b>Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F)</b> MH_MW01, MH_MW03	MF_MW01,	17-DEC-2013	---	15-JUN-2014	----	22-DEC-2013	15-JUN-2014	✓
<b>EG020T: Total Metals by ICP-MS</b>								
<b>Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)</b> RB01_171213CF		17-DEC-2013	23-DEC-2013	15-JUN-2014	✓	23-DEC-2013	15-JUN-2014	✓



Matrix: **WATER** Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EG035F: Dissolved Mercury by FIMS</b>							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG035F) MF_MW02, MG_X_MP1, D01_171213CF	17-DEC-2013	---	14-JAN-2014	----	23-DEC-2013	14-JAN-2014	✓
Clear Plastic Bottle - Filtered; Lab-acidified (EG035F) MH_MW01, MF_MW01, MH_MW03	17-DEC-2013	---	14-JAN-2014	----	23-DEC-2013	14-JAN-2014	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG035T) RB01_171213CF	17-DEC-2013	----	----	----	24-DEC-2013	14-JAN-2014	✓
<b>EG051G: Ferrous Iron by Discrete Analyser</b>							
Clear Plastic Bottle - HCl (EG051G) MH_MW01, MG_X_MP1	17-DEC-2013	----	----	----	22-DEC-2013	18-DEC-2013	✗
Clear Plastic Bottle - HCl - Filtered (EG051G) MF_MW01, MF_MW02, D01_171213CF	17-DEC-2013	----	----	----	24-DEC-2013	24-DEC-2013	✓
Clear Plastic Bottle - Natural (EG051G) MH_MW03	17-DEC-2013	----	----	----	22-DEC-2013	18-DEC-2013	✗
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS</b>							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094A-F) MF_MW02, MG_X_MP1, D01_171213CF	17-DEC-2013	---	15-JUN-2014	----	24-DEC-2013	15-JUN-2014	✓
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS</b>							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094B-F) MF_MW02, MG_X_MP1, D01_171213CF	17-DEC-2013	---	15-JUN-2014	----	24-DEC-2013	15-JUN-2014	✓
<b>EK040P: Fluoride by PC Titrator</b>							
Clear Plastic Bottle - Natural (EK040P) MH_MW01, MF_MW01, MF_MW02, MG_X_MP1, MH_MW03, D01_171213CF	17-DEC-2013	---	14-JAN-2014	----	21-DEC-2013	14-JAN-2014	✓
<b>EP080/071: Total Petroleum Hydrocarbons</b>							
Amber Glass Bottle - Unpreserved (EP071) MH_MW01, MF_MW01, MF_MW02, MG_X_MP1, MH_MW03, D01_171213CF, RB01_171213CF	17-DEC-2013	23-DEC-2013	24-DEC-2013	✓	31-DEC-2013	09-FEB-2014	✓
<b>EP075(SIM)A: Phenolic Compounds</b>							
Amber Glass Bottle - Unpreserved (EP075(SIM)) MH_MW01, MF_MW01, MF_MW02, MG_X_MP1, MH_MW03, D01_171213CF, RB01_171213CF	17-DEC-2013	23-DEC-2013	24-DEC-2013	✓	31-DEC-2013	09-FEB-2014	✓



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
<b>Amber Glass Bottle - Unpreserved (EP075(SIM))</b>								
MH_MW01, MF_MW02, MH_MW03, RB01_171213CF	MF_MW01, MG_X_MP1, D01_171213CF,	17-DEC-2013	23-DEC-2013	24-DEC-2013	✓	31-DEC-2013	09-FEB-2014	✓
<b>EP080: BTEXN</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b>								
MH_MW01, MF_MW02, MH_MW03, RB01_171213CF	MF_MW01, MG_X_MP1, D01_171213CF,	17-DEC-2013	24-DEC-2013	31-DEC-2013	✓	24-DEC-2013	31-DEC-2013	✓
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b>								
MH_MW01, MF_MW02, MH_MW03, RB01_171213CF	MF_MW01, MG_X_MP1, D01_171213CF,	17-DEC-2013	24-DEC-2013	31-DEC-2013	✓	24-DEC-2013	31-DEC-2013	✓





## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Alkalinity by PC Titrator	ED037-P	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	4	39	10.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	2	17	11.8	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	3	27	11.1	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	4	40	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	39	10.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	8	12.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
Alkalinity by PC Titrator	ED037-P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	4	39	10.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	2	27	7.4	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	16	6.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	39	5.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
Chloride by Discrete Analyser	ED045G	2	39	5.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	2	27	7.4	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	16	6.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



Matrix: **WATER** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Method Blanks (MB) - Continued</b>							
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	39	5.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
Chloride by Discrete Analyser	ED045G	2	39	5.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	2	27	7.4	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	39	5.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Sulfate (Turbidimetric) as SO <sub>4</sub> <sup>2-</sup> by Discrete Analyser	ED041G	WATER	APHA 21st ed., 4500-SO <sub>4</sub> Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> <sup>2-</sup> concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Chloride by Discrete Analyser	ED045G	WATER	APHA 21st ed., 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	Major Cations is determined based on APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um filtered sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Hardness parameters are calculated based on APHA 21st ed., 2340 B. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): Samples are 0.45 um filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) Samples are 0.45 um filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)



Analytical Methods	Method	Matrix	Method Descriptions
Total Mercury by FIMS	EG035T	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Ferrous Iron by Discrete Analyser	EG051G	WATER	APHA 21st ed., 3500 Fe-B. A colorimetric determination based on the reaction between phenanthroline and ferrous iron at pH 3.2-3.3 to form an orange-red complex that is measured against a five-point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Fluoride by PC Titrator	EK040P	WATER	APHA 21st ed., 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by Turbi SO4 by DA. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
TPH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
TPH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals	EN25	WATER	USEPA SW846-3005 Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Lab Acidification of Metals	EN80	WATER	USEPA Method 200.8
Lab Acidification of Dissolved Metals	EN80F	WATER	US EPA Method 200.8

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Work Order : ES1327849 Amendment 1  
Client : ENVIRO RESOURCES MANAGEMENT  
Project : SYMPHONY-DELTA WEST



<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Separatory Funnel Extraction of Liquids	ORG14	WATER	USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.



## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Laboratory Control Spike (LCS) Recoveries</b>							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	3852305-008	----	Fluorene	86-73-7	63.4 %	63.9-115%	Recovery less than lower control limit
<b>Matrix Spike (MS) Recoveries</b>							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	ES1327849-001	MH_MW01	Sulfate as SO4 - Turbidimetric	14808-79-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	ES1327849-002	MF_MW01	Sulfate as SO4 - Turbidimetric	14808-79-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG094F: Dissolved Metals in Fresh Water by ORC-ICP	ES1327849-006	D01_171213CF	Manganese	7439-96-5	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG094F: Dissolved Metals in Fresh Water by ORC-ICP	ES1327849-006	D01_171213CF	Nickel	7440-02-0	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG094F: Dissolved Metals in Fresh Water by ORC-ICP	ES1327849-006	D01_171213CF	Zinc	7440-66-6	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.

#### Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

Matrix: **WATER**

Method	Container / Client Sample ID(s)	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue	
<b>EG051G: Ferrous Iron by Discrete Analyser</b>								
Clear Plastic Bottle - HCl	MH_MW01,	MG_X_MP1	----	----	----	22-DEC-2013	18-DEC-2013	4



Matrix: **WATER**

Method Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
<b>EG051G: Ferrous Iron by Discrete Analyser - Analysis Holding Time Compliance</b>						
Clear Plastic Bottle - Natural MH_MW03	----	----	----	22-DEC-2013	18-DEC-2013	4

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- **No Quality Control Sample Frequency Outliers exist.**



**SAMPLE RECEIPT NOTIFICATION (SRN)****Comprehensive Report**

<b>Work Order</b>	: <b>ES1327849</b>		
<b>Amendment</b>	: <b>1</b>		
<b>Client</b>	: <b>ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: SYMPHONY DELTAWEST	<b>Contact</b>	: Barbara Hanna
<b>Address</b>	: GRND FLOOR, 33 SAUNDERS STREET PYRMONT NSW AUSTRALIA 2009	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: symphony.deltawest@erm.com	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: SYMPHONY-DELTA WEST	<b>Page</b>	: 1 of 3
<b>Order number</b>	: 0207420/0207423		
<b>C-O-C number</b>	: ----	<b>Quote number</b>	: ES2013ENVRES0360 (SY/551/13 V4)
<b>Site</b>	: ----		
<b>Sampler</b>	: CF	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement

**Dates**

<b>Date Samples Received</b>	: 19-DEC-2013	<b>Issue Date</b>	: 28-JAN-2014 09:58
<b>Client Requested Due Date</b>	: 06-JAN-2014	<b>Scheduled Reporting Date</b>	: <b>06-JAN-2014</b>

**Delivery Details**

<b>Mode of Delivery</b>	: Carrier	<b>Temperature</b>	: 5.9°C - Ice present
<b>No. of coolers/boxes</b>	: 4 HARDS	<b>No. of samples received</b>	: 7
<b>Security Seal</b>	: Intact.	<b>No. of samples analysed</b>	: 7

**General Comments**

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Sample containers do not comply to pretreatment / preservation standards (AS, APHA, USEPA). Please refer to the Sample Container(s)/Preservation Non-Compliance Log at the end of this report for details.**
- **Breaches in recommended extraction / analysis holding times may occur. Please refer to the 'Proactive Holding Time Report' below for further details. Please contact ALS if further information is required.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



### Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

Method	Sample Container Received	Preferred Sample Container for Analysis
<b>EG051G : Ferrous Iron by Discrete Analyser</b>		
<b>MH_MW03</b>	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - HCl - Filtered

### Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EG020F Dissolved Metals by ICPMS	WATER - EG035F Dissolved Mercury by FIMS	WATER - EG051G Ferrous Iron by Discrete Analyser	WATER - EG094A-F Dissolved Metals in Fresh Water Suite	WATER - EG094B-F Dissolved Metals in fresh water	WATER - EK040-P Fluoride(PC)	WATER - EN055 - PG Ionic Balance by ED037P, ED041G,	WATER - NT-01 Major Cations (Ca, Mg, Na, K)
ES1327849-001	17-DEC-2013 09:30	MH_MW01			✓			✓	✓	✓
	17-DEC-2013 15:00	MH_MW01	✓	✓						
ES1327849-002	17-DEC-2013 16:32	MF_MW01	✓	✓	✓			✓	✓	✓
ES1327849-003	17-DEC-2013 15:03	MF_MW02		✓	✓	✓	✓	✓	✓	✓
ES1327849-004	17-DEC-2013 13:30	MG_X_MP1		✓	✓	✓	✓	✓	✓	✓
ES1327849-005	17-DEC-2013 11:14	MH_MW03	✓	✓	✓			✓	✓	✓
ES1327849-006	17-DEC-2013 15:00	D01_171213CF		✓	✓	✓	✓	✓	✓	✓

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - NT-02 Major Anions (Chloride, Sulphate,	WATER - W-24 TPH/BTEX/PAH/Phenols	WATER - W-27T TRH/BTEXNI/PAH/Phenols/Total 8
ES1327849-001	17-DEC-2013 09:30	MH_MW01	✓	✓	
ES1327849-002	17-DEC-2013 16:32	MF_MW01	✓	✓	
ES1327849-003	17-DEC-2013 15:03	MF_MW02	✓	✓	
ES1327849-004	17-DEC-2013 13:30	MG_X_MP1	✓	✓	
ES1327849-005	17-DEC-2013 11:14	MH_MW03	✓	✓	
ES1327849-006	17-DEC-2013 15:00	D01_171213CF	✓	✓	
ES1327849-007	17-DEC-2013 15:00	RB01_171213CF			✓



## Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method		Due for extraction	Due for analysis	Samples Received		Instructions Received	
Client Sample ID(s)	Container			Date	Evaluation	Date	Evaluation
<b>EG051G: Ferrous Iron by Discrete Analyser</b>							
MG_X_MP1	Clear Plastic Bottle - HCl	----	18-DEC-2013	19-DEC-2013	*	----	----
MH_MW01	Clear Plastic Bottle - HCl	----	18-DEC-2013	19-DEC-2013	*	----	----
MH_MW03	Clear Plastic Bottle - Natural	----	18-DEC-2013	19-DEC-2013	*	----	----

## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com

### SYMPHONY ERARING

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email Symphony.Eraring@erm.com  
Email Symphony.Eraring@erm.com  
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Email Symphony.Eraring@erm.com  
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Email Symphony.Eraring@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com



## CERTIFICATE OF ANALYSIS

Work Order	: <b>ES1327988</b>	Page	: 1 of 11
Amendment	: <b>1</b>		
Client	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: SYMPHONY DELTA WEST	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 0207420/0207423		
C-O-C number	: ----	Date Samples Received	: 20-DEC-2013
Sampler	: DB	Issue Date	: 28-JAN-2014
Site	: ----		
Quote number	: SY/551/13 V4	No. of samples received	: 8
		No. of samples analysed	: 8

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EP080: Sample TRIP SPIKE contains volatile compounds spiked into the sample containers prior to dispatch from the laboratory. BTEX compounds spiked at 20 ug/L.**



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

## Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Lana Nguyen	Senior LCMS Chemist	Sydney Organics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Organics
Raymond Commodor	Instrument Chemist	Sydney Inorganics



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MH_X_4/D8	ML_MW15	ML_MW10	ML_MW05	DUP01_191213DB
				18-DEC-2013 15:00	19-DEC-2013 15:00	19-DEC-2013 15:00	19-DEC-2013 15:00	19-DEC-2013 15:00
Compound	CAS Number	LOR	Unit	ES1327988-001	ES1327988-002	ES1327988-003	ES1327988-004	ES1327988-005
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	34	215	437	657	681
Total Alkalinity as CaCO3	----	1	mg/L	34	215	437	657	681
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	472	45	108	219	224
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	60	48	109	391	388
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	88	60	116	127	126
Magnesium	7439-95-4	1	mg/L	68	26	64	169	168
Sodium	7440-23-5	1	mg/L	57	31	65	169	168
Potassium	7440-09-7	1	mg/L	7	14	17	23	23
<b>EG020F: Dissolved Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	<0.001	0.012	0.010	0.010	0.008
Cadmium	7440-43-9	0.0001	mg/L	0.0006	0.0004	0.0005	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	0.001	<0.001	0.002	<0.001	0.002
Nickel	7440-02-0	0.001	mg/L	0.218	0.019	0.106	0.120	0.130
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.013	0.004	0.003
Zinc	7440-66-6	0.005	mg/L	0.153	0.018	0.036	0.013	0.024
Manganese	7439-96-5	0.001	mg/L	3.96	1.24	0.430	1.78	1.79
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Boron	7440-42-8	0.05	mg/L	0.10	<0.05	<0.05	<0.05	<0.05
<b>EG035F: Dissolved Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
<b>EG051G: Ferrous Iron by Discrete Analyser</b>								
Ferrous Iron	----	0.05	mg/L	0.32	3.25	0.18	0.44	0.26
<b>EK040P: Fluoride by PC Titrator</b>								
Fluoride	16984-48-8	0.1	mg/L	<0.1	0.2	0.2	0.3	0.3
<b>EN055: Ionic Balance</b>								
Total Anions	----	0.01	meq/L	12.2	6.59	14.0	28.7	29.2
Total Cations	----	0.01	meq/L	12.6	6.84	14.3	28.2	28.0





## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MH_X_4/D8	ML_MW15	ML_MW10	ML_MW05	DUP01_191213DB
				18-DEC-2013 15:00	19-DEC-2013 15:00	19-DEC-2013 15:00	19-DEC-2013 15:00	19-DEC-2013 15:00
Compound	CAS Number	LOR	Unit	ES1327988-001	ES1327988-002	ES1327988-003	ES1327988-004	ES1327988-005
<b>EN055: Ionic Balance - Continued</b>								
Ionic Balance	----	0.01	%	1.80	1.90	0.93	0.94	2.11
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	1	µg/L	----	<1	<1	<1	<1
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	5	µg/L	----	<5	<5	<5	<5
Isopropylbenzene	98-82-8	5	µg/L	----	<5	<5	<5	<5
n-Propylbenzene	103-65-1	5	µg/L	----	<5	<5	<5	<5
1.3.5-Trimethylbenzene	108-67-8	5	µg/L	----	<5	<5	<5	<5
sec-Butylbenzene	135-98-8	5	µg/L	----	<5	<5	<5	<5
1.2.4-Trimethylbenzene	95-63-6	5	µg/L	----	<5	<5	<5	<5
tert-Butylbenzene	98-06-6	5	µg/L	----	<5	<5	<5	<5
p-Isopropyltoluene	99-87-6	5	µg/L	----	<5	<5	<5	<5
n-Butylbenzene	104-51-8	5	µg/L	----	<5	<5	<5	<5
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	50	µg/L	----	<50	<50	<50	<50
2-Butanone (MEK)	78-93-3	50	µg/L	----	<50	<50	<50	<50
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	----	<50	<50	<50	<50
2-Hexanone (MBK)	591-78-6	50	µg/L	----	<50	<50	<50	<50
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	5	µg/L	----	<5	<5	<5	<5
<b>EP074D: Fumigants</b>								
2.2-Dichloropropane	594-20-7	5	µg/L	----	<5	<5	<5	<5
1.2-Dichloropropane	78-87-5	5	µg/L	----	<5	<5	<5	<5
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	----	<5	<5	<5	<5
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	----	<5	<5	<5	<5
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	----	<5	<5	<5	<5
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	50	µg/L	----	<50	<50	<50	<50
Chloromethane	74-87-3	50	µg/L	----	<50	<50	<50	<50
Vinyl chloride	75-01-4	50	µg/L	----	<50	<50	<50	<50
Bromomethane	74-83-9	50	µg/L	----	<50	<50	<50	<50
Chloroethane	75-00-3	50	µg/L	----	<50	<50	<50	<50
Trichlorofluoromethane	75-69-4	50	µg/L	----	<50	<50	<50	<50



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MH_X_4/D8	ML_MW15	ML_MW10	ML_MW05	DUP01_191213DB
				18-DEC-2013 15:00	19-DEC-2013 15:00	19-DEC-2013 15:00	19-DEC-2013 15:00	19-DEC-2013 15:00
Compound	CAS Number	LOR	Unit	ES1327988-001	ES1327988-002	ES1327988-003	ES1327988-004	ES1327988-005
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
1.1-Dichloroethene	75-35-4	5	µg/L	----	<5	<5	<5	<5
Iodomethane	74-88-4	5	µg/L	----	<5	<5	<5	<5
trans-1.2-Dichloroethene	156-60-5	5	µg/L	----	<5	<5	<5	<5
1.1-Dichloroethane	75-34-3	5	µg/L	----	<5	<5	<5	<5
cis-1.2-Dichloroethene	156-59-2	5	µg/L	----	<5	<5	<5	<5
1.1.1-Trichloroethane	71-55-6	5	µg/L	----	<5	<5	<5	<5
1.1-Dichloropropylene	563-58-6	5	µg/L	----	<5	<5	<5	<5
Carbon Tetrachloride	56-23-5	5	µg/L	----	<5	<5	<5	<5
1.2-Dichloroethane	107-06-2	5	µg/L	----	<5	<5	<5	<5
Trichloroethene	79-01-6	5	µg/L	----	<5	<5	<5	<5
Dibromomethane	74-95-3	5	µg/L	----	<5	<5	<5	<5
1.1.2-Trichloroethane	79-00-5	5	µg/L	----	<5	<5	<5	<5
1.3-Dichloropropane	142-28-9	5	µg/L	----	<5	<5	<5	<5
Tetrachloroethene	127-18-4	5	µg/L	----	<5	<5	<5	<5
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	----	<5	<5	<5	<5
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	----	<5	<5	<5	<5
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	----	<5	<5	<5	<5
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	----	<5	<5	<5	<5
1.2.3-Trichloropropane	96-18-4	5	µg/L	----	<5	<5	<5	<5
Pentachloroethane	76-01-7	5	µg/L	----	<5	<5	<5	<5
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	----	<5	<5	<5	<5
Hexachlorobutadiene	87-68-3	5	µg/L	----	<5	<5	<5	<5
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	5	µg/L	----	<5	<5	<5	<5
Bromobenzene	108-86-1	5	µg/L	----	<5	<5	<5	<5
2-Chlorotoluene	95-49-8	5	µg/L	----	<5	<5	<5	<5
4-Chlorotoluene	106-43-4	5	µg/L	----	<5	<5	<5	<5
1.3-Dichlorobenzene	541-73-1	5	µg/L	----	<5	<5	<5	<5
1.4-Dichlorobenzene	106-46-7	5	µg/L	----	<5	<5	<5	<5
1.2-Dichlorobenzene	95-50-1	5	µg/L	----	<5	<5	<5	<5
1.2.4-Trichlorobenzene	120-82-1	5	µg/L	----	<5	<5	<5	<5
1.2.3-Trichlorobenzene	87-61-6	5	µg/L	----	<5	<5	<5	<5
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	5	µg/L	----	<5	<5	<5	<5



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MH_X_4/D8	ML_MW15	ML_MW10	ML_MW05	DUP01_191213DB
				18-DEC-2013 15:00	19-DEC-2013 15:00	19-DEC-2013 15:00	19-DEC-2013 15:00	19-DEC-2013 15:00
Compound	CAS Number	LOR	Unit	ES1327988-001	ES1327988-002	ES1327988-003	ES1327988-004	ES1327988-005
<b>EP074G: Trihalomethanes - Continued</b>								
Bromodichloromethane	75-27-4	5	µg/L	----	<5	<5	<5	<5
Dibromochloromethane	124-48-1	5	µg/L	----	<5	<5	<5	<5
Bromoform	75-25-2	5	µg/L	----	<5	<5	<5	<5
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	7	µg/L	----	<7	<7	<7	<7
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MH_X_4/D8	ML_MW15	ML_MW10	ML_MW05	DUP01_191213DB
				18-DEC-2013 15:00	19-DEC-2013 15:00	19-DEC-2013 15:00	19-DEC-2013 15:00	19-DEC-2013 15:00
Compound	CAS Number	LOR	Unit	ES1327988-001	ES1327988-002	ES1327988-003	ES1327988-004	ES1327988-005
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	----	72.1	69.5	73.8	68.3
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	113	113	113	111
Toluene-D8	2037-26-5	0.1	%	----	122	123	115	104



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MH_X_4/D8	ML_MW15	ML_MW10	ML_MW05	DUP01_191213DB
				18-DEC-2013 15:00	19-DEC-2013 15:00	19-DEC-2013 15:00	19-DEC-2013 15:00	19-DEC-2013 15:00
Compound	CAS Number	LOR	Unit	ES1327988-001	ES1327988-002	ES1327988-003	ES1327988-004	ES1327988-005
<b>EP074S: VOC Surrogates - Continued</b>								
4-Bromofluorobenzene	460-00-4	0.1	%	----	114	116	110	103
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	18.2	19.4	17.6	18.3	19.0
2-Chlorophenol-D4	93951-73-6	0.1	%	46.2	41.3	39.4	39.2	40.7
2,4,6-Tribromophenol	118-79-6	0.1	%	59.5	48.4	45.6	49.2	48.4
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	60.6	60.8	45.6	51.6	55.5
Anthracene-d10	1719-06-8	0.1	%	72.3	62.8	60.6	59.5	57.8
4-Terphenyl-d14	1718-51-0	0.1	%	83.1	67.2	67.2	77.5	61.0
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	113	114	115	115	113
Toluene-D8	2037-26-5	0.1	%	117	120	121	113	102
4-Bromofluorobenzene	460-00-4	0.1	%	102	105	106	102	94.3



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				R01_191213DB	TS	TB	---	---
				19-DEC-2013 15:00	19-DEC-2013 15:00	19-DEC-2013 15:00	---	---
Compound	CAS Number	LOR	Unit	ES1327988-006	ES1327988-007	ES1327988-008	---	---
<b>EG020T: Total Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	<0.001	---	---	---	---
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	---	---	---	---
Chromium	7440-47-3	0.001	mg/L	<0.001	---	---	---	---
Copper	7440-50-8	0.001	mg/L	<0.001	---	---	---	---
Nickel	7440-02-0	0.001	mg/L	<0.001	---	---	---	---
Lead	7439-92-1	0.001	mg/L	<0.001	---	---	---	---
Zinc	7440-66-6	0.005	mg/L	<0.005	---	---	---	---
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	---	---	---	---
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	---	20	µg/L	<20	---	<20	---	---
C10 - C14 Fraction	---	50	µg/L	<50	---	---	---	---
C15 - C28 Fraction	---	100	µg/L	<100	---	---	---	---
C29 - C36 Fraction	---	50	µg/L	<50	---	---	---	---
^ C10 - C36 Fraction (sum)	---	50	µg/L	<50	---	---	---	---
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	---	<20	---	---
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	---	<20	---	---
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	---	---	---	---
>C16 - C34 Fraction	---	100	µg/L	<100	---	---	---	---
>C34 - C40 Fraction	---	100	µg/L	<100	---	---	---	---
^ >C10 - C40 Fraction (sum)	---	100	µg/L	<100	---	---	---	---
^ >C10 - C16 Fraction minus Naphthalene (F2)	---	100	µg/L	<100	---	---	---	---
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	<1	17	<1	---	---
Toluene	108-88-3	2	µg/L	<2	18	<2	---	---
Ethylbenzene	100-41-4	2	µg/L	<2	17	<2	---	---
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	17	<2	---	---
ortho-Xylene	95-47-6	2	µg/L	<2	17	<2	---	---
^ Total Xylenes	1330-20-7	2	µg/L	<2	34	<2	---	---
^ Sum of BTEX	---	1	µg/L	<1	86	<1	---	---
Naphthalene	91-20-3	5	µg/L	<5	19	<5	---	---



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

<b>R01_191213DB</b>	<b>TS</b>	<b>TB</b>	----	----
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Client sampling date / time

19-DEC-2013 15:00	19-DEC-2013 15:00	19-DEC-2013 15:00	----	----
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Compound	CAS Number	LOR	Unit	<b>ES1327988-006</b>	<b>ES1327988-007</b>	<b>ES1327988-008</b>	----	----
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### EP080S: TPH(V)/BTEX Surrogates

<b>1,2-Dichloroethane-D4</b>	17060-07-0	0.1	%	<b>134</b>	<b>111</b>	<b>117</b>	----	----
<b>Toluene-D8</b>	2037-26-5	0.1	%	<b>107</b>	<b>118</b>	<b>124</b>	----	----
<b>4-Bromofluorobenzene</b>	460-00-4	0.1	%	<b>98.3</b>	<b>114</b>	<b>118</b>	----	----





## Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP066S: PCB Surrogate</b>			
Decachlorobiphenyl	2051-24-3	28.5	129
<b>EP074S: VOC Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	78.3	133.2
Toluene-D8	2037-26-5	79.1	128.9
4-Bromofluorobenzene	460-00-4	80.8	123.7
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	10.0	44
2-Chlorophenol-D4	93951-73-6	14	94
2,4,6-Tribromophenol	118-79-6	17	125
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27.4	113
4-Terphenyl-d14	1718-51-0	32	112
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: ES1327988</b>	Page	: 1 of 21
<b>Amendment</b>	<b>: 1</b>		
<b>Client</b>	<b>: ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: MR JONATHAN LEKAWSKI	<b>Contact</b>	: Barbara Hanna
<b>Address</b>	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: jonathan.lekawski@erm.com	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: SYMPHONY DELTA WEST	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b>	: ----		
<b>C-O-C number</b>	: ----	<b>Date Samples Received</b>	: 20-DEC-2013
<b>Sampler</b>	: DB	<b>Issue Date</b>	: 28-JAN-2014
<b>Order number</b>	: 0207420/0207423		
<b>Quote number</b>	: SY/551/13 V4	<b>No. of samples received</b>	: 8
		<b>No. of samples analysed</b>	: 8

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :  
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
RPD = Relative Percentage Difference  
# = Indicates failed QC



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Laboratory 825

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compliance with  
ISO/IEC 17025.

## Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Lana Nguyen	Senior LCMS Chemist	Sydney Organics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Organics
Raymond Commodor	Instrument Chemist	Sydney Inorganics



## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>ED037P: Alkalinity by PC Titrator (QC Lot: 3225575)</b>									
ES1327901-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	3	2	48.5	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	3	2	48.5	No Limit
ES1327914-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	26	26	0.0	0% - 20%
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	335	336	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	362	362	0.0	0% - 20%
<b>ED037P: Alkalinity by PC Titrator (QC Lot: 3225580)</b>									
ES1327988-004	ML_MW05	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	657	661	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	657	661	0.6	0% - 20%
ES1327989-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	98	99	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	98	99	0.0	0% - 20%
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3227253)</b>									
ES1327849-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1070	1070	0.2	0% - 20%
ES1327850-006	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	140	138	0.9	0% - 20%
<b>ED045G: Chloride Discrete analyser (QC Lot: 3227252)</b>									
ES1327849-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	68	69	1.6	0% - 20%
ES1327850-006	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	33	34	0.0	0% - 20%
<b>ED093F: Dissolved Major Cations (QC Lot: 3227251)</b>									
ES1327849-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	168	168	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	104	103	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	208	208	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	27	27	0.0	0% - 20%
ES1327850-007	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	84	82	2.1	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	55	54	1.8	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	16	16	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	36	36	0.0	0% - 20%
<b>EG020F: Dissolved Metals by ICP-MS (QC Lot: 3232982)</b>									
ES1327988-001	MH_X_4/D8	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0006	0.0006	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG020F: Dissolved Metals by ICP-MS (QC Lot: 3232982) - continued</b>									
ES1327988-001	MH_X_4/D8	EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	3.96	3.90	1.5	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.218	0.209	4.1	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.153	0.158	3.2	0% - 20%
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	0.10	0.09	0.0	No Limit
ES1327999-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.022	0.020	10.3	0% - 20%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.035	0.033	5.0	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.009	0.008	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	0.08	0.08	0.0	No Limit
<b>EG020T: Total Metals by ICP-MS (QC Lot: 3232984)</b>									
ES1327988-006	R01_191213DB	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
ME1301790-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.002	0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.010	0.008	18.5	No Limit
<b>EG035F: Dissolved Mercury by FIMS (QC Lot: 3232981)</b>									
ES1327840-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1327997-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3228806)</b>									
ES1327849-007	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
<b>EG051G: Ferrous Iron by Discrete Analyser (QC Lot: 3229114)</b>									
ES1327935-006	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	13.3	13.5	1.5	0% - 20%



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG051G: Ferrous Iron by Discrete Analyser (QC Lot: 3229114) - continued</b>									
ES1327989-002	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	11.8	11.8	0.09	0% - 20%
<b>EK040P: Fluoride by PC Titrator (QC Lot: 3225579)</b>									
ES1327966-003	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	1.5	1.5	0.0	0% - 50%
ES1327988-004	ML_MW05	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.3	0.3	0.0	No Limit
<b>EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 3227579)</b>									
ES1327988-002	ML_MW15	EP066: Total Polychlorinated biphenyls	----	1	µg/L	<1	<1	0.0	No Limit
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3229766)</b>									
ES1327988-002	ML_MW15	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
ES1327988-003	ML_MW10	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
<b>EP074B: Oxygenated Compounds (QC Lot: 3229766)</b>									
ES1327988-002	ML_MW15	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
ES1327988-003	ML_MW10	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
<b>EP074C: Sulfonated Compounds (QC Lot: 3229766)</b>									
ES1327988-002	ML_MW15	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
ES1327988-003	ML_MW10	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
<b>EP074D: Fumigants (QC Lot: 3229766)</b>									
ES1327988-002	ML_MW15	EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report							
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)		
<b>EP074D: Fumigants (QC Lot: 3229766) - continued</b>											
ES1327988-002	ML_MW15	EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit		
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit		
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit		
ES1327988-003	ML_MW10	EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit		
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit		
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit		
		<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3229766)</b>									
		ES1327988-002	ML_MW15	EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
				EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
EP074: trans-1,2-Dichloroethene	156-60-5			5	µg/L	<5	<5	0.0	No Limit		
EP074: 1,1-Dichloroethane	75-34-3			5	µg/L	<5	<5	0.0	No Limit		
EP074: cis-1,2-Dichloroethene	156-59-2			5	µg/L	<5	<5	0.0	No Limit		
EP074: 1,1,1-Trichloroethane	71-55-6			5	µg/L	<5	<5	0.0	No Limit		
EP074: 1,1-Dichloropropylene	563-58-6			5	µg/L	<5	<5	0.0	No Limit		
EP074: Carbon Tetrachloride	56-23-5			5	µg/L	<5	<5	0.0	No Limit		
EP074: 1,2-Dichloroethane	107-06-2			5	µg/L	<5	<5	0.0	No Limit		
EP074: Trichloroethene	79-01-6			5	µg/L	<5	<5	0.0	No Limit		
EP074: Dibromomethane	74-95-3			5	µg/L	<5	<5	0.0	No Limit		
EP074: 1,1,2-Trichloroethane	79-00-5			5	µg/L	<5	<5	0.0	No Limit		
EP074: 1,3-Dichloropropane	142-28-9			5	µg/L	<5	<5	0.0	No Limit		
EP074: Tetrachloroethene	127-18-4			5	µg/L	<5	<5	0.0	No Limit		
EP074: 1,1,1,2-Tetrachloroethane	630-20-6			5	µg/L	<5	<5	0.0	No Limit		
EP074: trans-1,4-Dichloro-2-butene	110-57-6			5	µg/L	<5	<5	0.0	No Limit		
EP074: cis-1,4-Dichloro-2-butene	1476-11-5			5	µg/L	<5	<5	0.0	No Limit		
EP074: 1,1,2,2-Tetrachloroethane	79-34-5			5	µg/L	<5	<5	0.0	No Limit		
EP074: 1,2,3-Trichloropropane	96-18-4			5	µg/L	<5	<5	0.0	No Limit		
EP074: Pentachloroethane	76-01-7			5	µg/L	<5	<5	0.0	No Limit		
EP074: 1,2-Dibromo-3-chloropropane	96-12-8			5	µg/L	<5	<5	0.0	No Limit		
EP074: Hexachlorobutadiene	87-68-3			5	µg/L	<5	<5	0.0	No Limit		
EP074: Dichlorodifluoromethane	75-71-8			50	µg/L	<50	<50	0.0	No Limit		
EP074: Chloromethane	74-87-3			50	µg/L	<50	<50	0.0	No Limit		
EP074: Vinyl chloride	75-01-4			50	µg/L	<50	<50	0.0	No Limit		
EP074: Bromomethane	74-83-9			50	µg/L	<50	<50	0.0	No Limit		
EP074: Chloroethane	75-00-3			50	µg/L	<50	<50	0.0	No Limit		
EP074: Trichlorofluoromethane	75-69-4			50	µg/L	<50	<50	0.0	No Limit		
ES1327988-003	ML_MW10			EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
				EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit





Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3229766) - continued</b>									
ES1327988-003	ML_MW10	EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit		
EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit		
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit		
EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit		
EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit		
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit		
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3229766)</b>									
ES1327988-002	ML_MW15	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
ES1327988-003	ML_MW10	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3229766) - continued</b>									
ES1327988-003	ML_MW10	EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
<b>EP074G: Trihalomethanes (QC Lot: 3229766)</b>									
ES1327988-002	ML_MW15	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
ES1327988-003	ML_MW10	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
<b>EP074H: Naphthalene (QC Lot: 3229766)</b>									
ES1327988-002	ML_MW15	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit
ES1327988-003	ML_MW10	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3227578)</b>									
ES1327988-003	ML_MW10	EP075(SIM): Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	0.0	No Limit
		<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3227578)</b>							
ES1327988-003	ML_MW10	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3227578) - continued</b>									
ES1327988-003	ML_MW10	EP075(SIM): Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3227577)</b>									
ES1327988-003	ML_MW10	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
ES1327988-002	ML_MW15	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3229767)</b>									
ES1327988-002	ML_MW15	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1327988-003	ML_MW10	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3229802)</b>									
ES1327901-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1328000-002	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3227577)</b>									
ES1327988-003	ML_MW10	EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
ES1327988-002	ML_MW15	EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3229767)</b>									
ES1327988-002	ML_MW15	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES1327988-003	ML_MW10	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3229802)</b>									
ES1327901-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES1328000-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3229767)</b>									
ES1327988-002	ML_MW15	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
<b>EP080: BTEXN (QC Lot: 3229767) - continued</b>										
ES1327988-002	ML_MW15	EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit	
ES1327988-003	ML_MW10	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit	
<b>EP080: BTEXN (QC Lot: 3229802)</b>										
ES1327901-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit	
ES1328000-002	Anonymous	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit	
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit	
EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit			



### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>ED037P: Alkalinity by PC Titrator (QCLot: 3225575)</b>									
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	----	200 mg/L	91.3	81	111	
<b>ED037P: Alkalinity by PC Titrator (QCLot: 3225580)</b>									
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	----	200 mg/L	97.3	81	111	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3227253)</b>									
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	100	86	122	
<b>ED045G: Chloride Discrete analyser (QCLot: 3227252)</b>									
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	95.6	77	123	
<b>ED093F: Dissolved Major Cations (QCLot: 3227251)</b>									
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	103	87	113	
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	89	113	
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	104	79	113	
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	104	87	115	
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3232982)</b>									
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	84.3	80	118	
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	91.5	82	112	
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	90.4	81	111	
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	89.2	80	112	
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	87.2	83	111	
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	89.9	81	113	
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	89.3	81	113	
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	83.2	73	125	
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	87.8	80	116	
EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.1 mg/L	96.8	69	123	
<b>EG020T: Total Metals by ICP-MS (QCLot: 3232984)</b>									
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	92.3	79	121	
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	92.2	82	114	
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	95.9	83	115	
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	91.9	83	117	
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	94.2	85	115	
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	96.0	83	117	
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	88.0	76	118	
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3232981)</b>									
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	99.8	78	114	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3228806)</b>									
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	103	77	115	
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3229114)</b>									
EG051G: Ferrous Iron	----	0.10	mg/L	<0.10	2.00 mg/L	101	89	113	
<b>EK040P: Fluoride by PC Titrator (QCLot: 3225579)</b>									
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5.0 mg/L	93.0	75	119	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3227579)</b>									
EP066: Total Polychlorinated biphenyls	----	1	µg/L	<1	10 µg/L	77.0	61.6	107	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3229766)</b>									
EP074: Styrene	100-42-5	5	µg/L	<5	10 µg/L	98.4	74	118	
EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	10 µg/L	104	75	121	
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	10 µg/L	104	67	123	
EP074: 1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	10 µg/L	104	70	122	
EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	10 µg/L	107	69	123	
EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	10 µg/L	103	71	121	
EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	10 µg/L	103	70	122	
EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	10 µg/L	107	67	123	
EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	10 µg/L	108	62	126	
<b>EP074B: Oxygenated Compounds (QCLot: 3229766)</b>									
EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	100 µg/L	101	61.4	134	
EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	100 µg/L	105	73.6	130	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	100 µg/L	104	61	139	
EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	100 µg/L	101	65	137	
<b>EP074C: Sulfonated Compounds (QCLot: 3229766)</b>									
EP074: Carbon disulfide	75-15-0	5	µg/L	<5	10 µg/L	78.3	72.8	127	
<b>EP074D: Fumigants (QCLot: 3229766)</b>									
EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	10 µg/L	102	61	119	
EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	10 µg/L	108	76	120	
EP074: cis-1,3-Dichloropropylene	10061-01-5	10	µg/L	<10	10 µg/L	90.0	62	120	
EP074: trans-1,3-Dichloropropylene	10061-02-6	10	µg/L	<10	10 µg/L	86.1	61	119	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	10 µg/L	102	69	117	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3229766)</b>									
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	100 µg/L	79.1	60.6	138	
EP074: Chloromethane	74-87-3	50	µg/L	<50	100 µg/L	88.2	67.4	130	
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	100 µg/L	113	69.4	129	
EP074: Bromomethane	74-83-9	50	µg/L	<50	100 µg/L	96.8	56	140	
EP074: Chloroethane	75-00-3	50	µg/L	<50	100 µg/L	99.2	63	135	
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	100 µg/L	105	65	131	
EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	10 µg/L	104	69	123	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3229766) - continued</b>									
EP074: Iodomethane	74-88-4	5	µg/L	<5	10 µg/L	85.4	70.2	128	
EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	10 µg/L	103	71	119	
EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	10 µg/L	106	75	119	
EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	10 µg/L	104	77	117	
EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	10 µg/L	101	61	119	
EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	10 µg/L	109	73	119	
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	10 µg/L	95.6	63	121	
EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	10 µg/L	113	78	122	
EP074: Trichloroethene	79-01-6	5	µg/L	<5	10 µg/L	107	74	120	
EP074: Dibromomethane	74-95-3	5	µg/L	<5	10 µg/L	106	74	118	
EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	10 µg/L	112	75	123	
EP074: 1,3-Dichloropropane	142-28-9	5	µg/L	<5	10 µg/L	110	79	121	
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	10 µg/L	111	72	124	
EP074: 1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	10 µg/L	92.0	66	114	
EP074: trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	10 µg/L	95.4	60	120	
EP074: cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	10 µg/L	91.9	70.6	128	
EP074: 1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	10 µg/L	101	70	124	
EP074: 1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	10 µg/L	112	74	128	
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	10 µg/L	81.6	71.8	126	
EP074: 1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	10 µg/L	83.6	66.4	136	
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	10 µg/L	114	58	132	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3229766)</b>									
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	10 µg/L	108	80	118	
EP074: Bromobenzene	108-86-1	5	µg/L	<5	10 µg/L	104	76	116	
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	10 µg/L	106	71	121	
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	10 µg/L	106	71	121	
EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	10 µg/L	108	74	120	
EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	10 µg/L	110	72	120	
EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	10 µg/L	109	77	117	
EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	10 µg/L	108	60	126	
EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	10 µg/L	113	67	125	
<b>EP074G: Trihalomethanes (QCLot: 3229766)</b>									
EP074: Chloroform	67-66-3	5	µg/L	<5	10 µg/L	109	76	118	
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	10 µg/L	93.5	64	118	
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	10 µg/L	90.3	65	115	
EP074: Bromoform	75-25-2	5	µg/L	<5	10 µg/L	92.8	73.5	126	
<b>EP074H: Naphthalene (QCLot: 3229766)</b>									
EP074: Naphthalene	91-20-3	7	µg/L	<7	10 µg/L	113	61	125	





Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3227578)</b>									
EP075(SIM): Phenol	108-95-2	0.2	µg/L	----	5 µg/L	36.0	24.5	61.9	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Chlorophenol	95-57-8	0.2	µg/L	----	5 µg/L	# 62.5	63.8	110	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Methylphenol	95-48-7	0.2	µg/L	----	5 µg/L	63.7	55.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	0.4	µg/L	----	10 µg/L	61.9	42.5	114	
		2	µg/L	<2.0	----	----	----	----	
EP075(SIM): 2-Nitrophenol	88-75-5	0.2	µg/L	----	5 µg/L	83.3	62.7	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.2	µg/L	----	5 µg/L	87.1	59.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.2	µg/L	----	5 µg/L	79.1	59.3	122	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.2	µg/L	----	5 µg/L	94.2	64.3	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.2	µg/L	----	5 µg/L	82.8	63	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.2	µg/L	----	5 µg/L	73.9	58.7	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.2	µg/L	----	5 µg/L	79.0	50	108	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Pentachlorophenol	87-86-5	0.4	µg/L	----	10 µg/L	34.8	8.7	95	
		2	µg/L	<2.0	----	----	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3227578)</b>									
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	5 µg/L	84.0	58.6	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	5 µg/L	69.4	63.6	114	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	5 µg/L	68.6	62.2	113	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	5 µg/L	67.6	63.9	115	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	5 µg/L	65.6	62.6	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	5 µg/L	66.5	64.3	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	5 µg/L	65.5	63.6	118	
		1	µg/L	<1.0	----	----	----	----	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3227578) - continued</b>									
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	5 µg/L	66.7	63.1	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	5 µg/L	76.3	64.1	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	5 µg/L	86.3	62.5	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	5 µg/L	78.3	61.7	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	5 µg/L	80.4	61.7	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	5 µg/L	69.7	63.3	117	
		0.5	µg/L	<0.5	----	----	----	----	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	5 µg/L	72.1	59.9	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	----	5 µg/L	70.2	61.2	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	----	5 µg/L	74.2	59.1	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	1	µg/L	<1.0	----	----	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3227577)</b>									
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	114	59	129	
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	95.2	71	131	
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	79.2	62	120	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229767)</b>									
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	108	75	127	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229802)</b>									
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	103	75	127	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3227577)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	2500 µg/L	103	58.9	131	
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	94.2	73.9	138	
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----	
		50	µg/L	----	1500 µg/L	85.2	67	127	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229767)</b>									
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	111	75	127	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229802)</b>									
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	104	75	127	
<b>EP080: BTEXN (QCLot: 3229767)</b>									
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	107	70	124	
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	106	65	129	



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EP080: BTEXN (QCLot: 3229767) - continued</b>									
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	100	70	120	
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	101	69	121	
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	102	72	122	
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	115	70	124	
<b>EP080: BTEXN (QCLot: 3229802)</b>									
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	112	70	124	
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	102	65	129	
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	99.2	70	120	
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	101	69	121	
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	104	72	122	
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	108	70	124	

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report				
				Spike Concentration	Spike Recovery(%)		Recovery Limits (%)	
					MS	Low	High	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3227253)</b>								
ES1327849-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130	
<b>ED045G: Chloride Discrete analyser (QCLot: 3227252)</b>								
ES1327849-001	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	96.4	70	130	
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3232982)</b>								
ES1327988-002	ML_MW15	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	98.1	70	130	
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	99.4	70	130	
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	90.4	70	130	
		EG020A-F: Copper	7440-50-8	0.2 mg/L	94.2	70	130	
		EG020A-F: Lead	7439-92-1	0.2 mg/L	90.4	70	130	
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	# Not Determined	70	130	
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	89.4	70	130	
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	97.4	70	130	
<b>EG020T: Total Metals by ICP-MS (QCLot: 3232984)</b>								
ES1328020-001	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	112	70	130	



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike	SpikeRecovery(%)	Recovery Limits (%)	
				Concentration	MS	Low	High
<b>EG020T: Total Metals by ICP-MS (QCLot: 3232984) - continued</b>							
ES1328020-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.25 mg/L	106	70	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	113	70	130
		EG020A-T: Copper	7440-50-8	1 mg/L	116	70	130
		EG020A-T: Lead	7439-92-1	1 mg/L	106	70	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	112	70	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	111	70	130
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3232981)</b>							
ES1327851-003	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	92.0	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3228806)</b>							
ES1327969-002	Anonymous	EG035T: Mercury	7439-97-6	0.010 mg/L	78.8	70	130
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3229114)</b>							
ES1327935-006	Anonymous	EG051G: Ferrous Iron	----	10 mg/L	92.0	68	128
<b>EK040P: Fluoride by PC Titrator (QCLot: 3225579)</b>							
ES1327966-003	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	103	70	130
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3227579)</b>							
ES1327988-002	ML_MW15	EP066: Total Polychlorinated biphenyls	----	10 µg/L	101	70	130
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3229766)</b>							
ES1327988-002	ML_MW15	EP074: 1,1-Dichloroethene	75-35-4	25 µg/L	108	70	130
		EP074: Trichloroethene	79-01-6	25 µg/L	126	70	130
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3229766)</b>							
ES1327988-002	ML_MW15	EP074: Chlorobenzene	108-90-7	25 µg/L	124	70	130
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3227578)</b>							
ES1327988-002	ML_MW15	EP075(SIM): Phenol	108-95-2	20 µg/L	40.0	20	130
		EP075(SIM): 2-Chlorophenol	95-57-8	20 µg/L	95.0	60	130
		EP075(SIM): 2-Nitrophenol	88-75-5	20 µg/L	80.0	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	20 µg/L	93.7	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	20 µg/L	35.2	20	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3227578)</b>							
ES1327988-002	ML_MW15	EP075(SIM): Acenaphthene	83-32-9	20 µg/L	83.0	70	130
		EP075(SIM): Pyrene	129-00-0	20 µg/L	83.5	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3227577)</b>							
ES1327988-002	ML_MW15	EP071: C10 - C14 Fraction	----	200 µg/L	88.9	74	150
		EP071: C15 - C28 Fraction	----	300 µg/L	104	77	153
		EP071: C29 - C36 Fraction	----	200 µg/L	109	67	153
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229767)</b>							



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report				
				Spike	SpikeRecovery(%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229767) - continued</b>								
ES1327988-002	ML_MW15	EP080: C6 - C9 Fraction	----	325 µg/L	124	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229802)</b>								
ES1327901-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	106	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3227577)</b>								
ES1327988-002	ML_MW15	EP071: >C10 - C16 Fraction	>C10_C16	250 µg/L	91.8	74	150	
		EP071: >C16 - C34 Fraction	----	350 µg/L	105	77	153	
		EP071: >C34 - C40 Fraction	----	150 µg/L	118	67	153	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229767)</b>								
ES1327988-002	ML_MW15	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	125	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229802)</b>								
ES1327901-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	108	70	130	
<b>EP080: BTEXN (QCLot: 3229767)</b>								
ES1327988-002	ML_MW15	EP080: Benzene	71-43-2	25 µg/L	109	70	130	
		EP080: Toluene	108-88-3	25 µg/L	111	70	130	
		EP080: Ethylbenzene	100-41-4	25 µg/L	117	70	130	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	118	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	25 µg/L	119	70	130	
	EP080: Naphthalene	91-20-3	25 µg/L	125	70	130		
<b>EP080: BTEXN (QCLot: 3229802)</b>								
ES1327901-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	107	70	130	
		EP080: Toluene	108-88-3	25 µg/L	104	70	130	
		EP080: Ethylbenzene	100-41-4	25 µg/L	104	70	130	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	102	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	25 µg/L	105	70	130	
	EP080: Naphthalene	91-20-3	25 µg/L	101	70	130		

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
					Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit	
<b>EK040P: Fluoride by PC Titrator (QCLot: 3225579)</b>											
ES1327966-003	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	103	----	70	130	----	----	



Sub-Matrix: WATER					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
						MS	MSD	Low	High	Value	Control Limit
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number								
<b>ED045G: Chloride Discrete analyser (QCLot: 3227252)</b>											
ES1327849-001	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	96.4	----	70	130	----	----	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3227253)</b>											
ES1327849-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3227577)</b>											
ES1327988-002	ML_MW15	EP071: C10 - C14 Fraction	----	200 µg/L	88.9	----	74	150	----	----	
		EP071: C15 - C28 Fraction	----	300 µg/L	104	----	77	153	----	----	
		EP071: C29 - C36 Fraction	----	200 µg/L	109	----	67	153	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3227577)</b>											
ES1327988-002	ML_MW15	EP071: >C10 - C16 Fraction	>C10_C16	250 µg/L	91.8	----	74	150	----	----	
		EP071: >C16 - C34 Fraction	----	350 µg/L	105	----	77	153	----	----	
		EP071: >C34 - C40 Fraction	----	150 µg/L	118	----	67	153	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3227578)</b>											
ES1327988-002	ML_MW15	EP075(SIM): Phenol	108-95-2	20 µg/L	40.0	----	20	130	----	----	
		EP075(SIM): 2-Chlorophenol	95-57-8	20 µg/L	95.0	----	60	130	----	----	
		EP075(SIM): 2-Nitrophenol	88-75-5	20 µg/L	80.0	----	60	130	----	----	
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	20 µg/L	93.7	----	70	130	----	----	
		EP075(SIM): Pentachlorophenol	87-86-5	20 µg/L	35.2	----	20	130	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3227578)</b>											
ES1327988-002	ML_MW15	EP075(SIM): Acenaphthene	83-32-9	20 µg/L	83.0	----	70	130	----	----	
		EP075(SIM): Pyrene	129-00-0	20 µg/L	83.5	----	70	130	----	----	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3227579)</b>											
ES1327988-002	ML_MW15	EP066: Total Polychlorinated biphenyls	----	10 µg/L	101	----	70	130	----	----	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3228806)</b>											
ES1327969-002	Anonymous	EG035T: Mercury	7439-97-6	0.010 mg/L	78.8	----	70	130	----	----	
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3229114)</b>											
ES1327935-006	Anonymous	EG051G: Ferrous Iron	----	10 mg/L	92.0	----	68	128	----	----	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3229766)</b>											
ES1327988-002	ML_MW15	EP074: 1,1-Dichloroethene	75-35-4	25 µg/L	108	----	70	130	----	----	
		EP074: Trichloroethene	79-01-6	25 µg/L	126	----	70	130	----	----	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3229766)</b>											
ES1327988-002	ML_MW15	EP074: Chlorobenzene	108-90-7	25 µg/L	124	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229767)</b>											
ES1327988-002	ML_MW15	EP080: C6 - C9 Fraction	----	325 µg/L	124	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229767)</b>											
ES1327988-002	ML_MW15	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	125	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3229767)</b>											



Sub-Matrix: WATER

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
					MS	MSD	Low	High	Value	Control Limit	
<b>EP080: BTEXN (QCLot: 3229767) - continued</b>											
ES1327988-002	ML_MW15	EP080: Benzene	71-43-2	25 µg/L	109	----	70	130	----	----	
		EP080: Toluene	108-88-3	25 µg/L	111	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	25 µg/L	117	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	118	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	25 µg/L	119	----	70	130	----	----	
		EP080: Naphthalene	91-20-3	25 µg/L	125	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229802)</b>											
ES1327901-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	106	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229802)</b>											
ES1327901-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	108	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3229802)</b>											
ES1327901-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	107	----	70	130	----	----	
		EP080: Toluene	108-88-3	25 µg/L	104	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	25 µg/L	104	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	102	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	25 µg/L	105	----	70	130	----	----	
		EP080: Naphthalene	91-20-3	25 µg/L	101	----	70	130	----	----	
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3232981)</b>											
ES1327851-003	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	92.0	----	70	130	----	----	
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3232982)</b>											
ES1327988-002	ML_MW15	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	98.1	----	70	130	----	----	
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	99.4	----	70	130	----	----	
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	90.4	----	70	130	----	----	
		EG020A-F: Copper	7440-50-8	0.2 mg/L	94.2	----	70	130	----	----	
		EG020A-F: Lead	7439-92-1	0.2 mg/L	90.4	----	70	130	----	----	
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	# Not Determined	----	70	130	----	----	
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	89.4	----	70	130	----	----	
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	97.4	----	70	130	----	----	
<b>EG020T: Total Metals by ICP-MS (QCLot: 3232984)</b>											
ES1328020-001	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	112	----	70	130	----	----	
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	106	----	70	130	----	----	
		EG020A-T: Chromium	7440-47-3	1 mg/L	113	----	70	130	----	----	
		EG020A-T: Copper	7440-50-8	1 mg/L	116	----	70	130	----	----	
		EG020A-T: Lead	7439-92-1	1 mg/L	106	----	70	130	----	----	
		EG020A-T: Nickel	7440-02-0	1 mg/L	112	----	70	130	----	----	



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 Work Order : ES1327988 Amendment 1  
 Client : ENVIRO RESOURCES MANAGEMENT  
 Project : SYMPHONY DELTA WEST



Sub-Matrix: **WATER**

					<i>Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report</i>					
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>Spike</i>	<i>Spike Recovery (%)</i>		<i>Recovery Limits (%)</i>		<i>RPDs (%)</i>	
				<i>Concentration</i>	<i>MS</i>	<i>MSD</i>	<i>Low</i>	<i>High</i>	<i>Value</i>	<i>Control Limit</i>
<b>EG020T: Total Metals by ICP-MS (QCLot: 3232984) - continued</b>										
ES1328020-001	Anonymous	EG020A-T: Zinc	7440-66-6	1 mg/L	111	----	70	130	----	----

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1327988</b>	Page	: 1 of 10
Amendment	: <b>1</b>		
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
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Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: SYMPHONY DELTA WEST	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 20-DEC-2013
Sampler	: DB	Issue Date	: 28-JAN-2014
Order number	: 0207420/0207423		
Quote number	: SY/551/13 V4	No. of samples received	: 8
		No. of samples analysed	: 8

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER** Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>ED037P: Alkalinity by PC Titrator</b>							
Clear Plastic Bottle - Natural (ED037-P) MH_X_4/D8	18-DEC-2013	---	01-JAN-2014	----	21-DEC-2013	01-JAN-2014	✓
Clear Plastic Bottle - Natural (ED037-P) ML_MW15, ML_MW05, ML_MW10, DUP01_191213DB	19-DEC-2013	---	02-JAN-2014	----	21-DEC-2013	02-JAN-2014	✓
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>							
Clear Plastic Bottle - Natural (ED041G) MH_X_4/D8	18-DEC-2013	---	15-JAN-2014	----	23-DEC-2013	15-JAN-2014	✓
Clear Plastic Bottle - Natural (ED041G) ML_MW15, ML_MW05, ML_MW10, DUP01_191213DB	19-DEC-2013	---	16-JAN-2014	----	23-DEC-2013	16-JAN-2014	✓
<b>ED045G: Chloride Discrete analyser</b>							
Clear Plastic Bottle - Natural (ED045G) MH_X_4/D8	18-DEC-2013	---	15-JAN-2014	----	23-DEC-2013	15-JAN-2014	✓
Clear Plastic Bottle - Natural (ED045G) ML_MW15, ML_MW05, ML_MW10, DUP01_191213DB	19-DEC-2013	---	16-JAN-2014	----	23-DEC-2013	16-JAN-2014	✓
<b>ED093F: Dissolved Major Cations</b>							
Clear Plastic Bottle - Natural (ED093F) MH_X_4/D8	18-DEC-2013	---	25-DEC-2013	----	23-DEC-2013	25-DEC-2013	✓
Clear Plastic Bottle - Natural (ED093F) ML_MW15, ML_MW05, ML_MW10, DUP01_191213DB	19-DEC-2013	---	26-DEC-2013	----	23-DEC-2013	26-DEC-2013	✓
<b>EG020F: Dissolved Metals by ICP-MS</b>							
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F) MH_X_4/D8	18-DEC-2013	---	16-JUN-2014	----	31-DEC-2013	16-JUN-2014	✓
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F) ML_MW15, ML_MW05, ML_MW10, DUP01_191213DB	19-DEC-2013	---	17-JUN-2014	----	31-DEC-2013	17-JUN-2014	✓
<b>EG020T: Total Metals by ICP-MS</b>							
Clear Plastic Bottle - Unspecified; Lab-acidified (EG020A-T) R01_191213DB	19-DEC-2013	31-DEC-2013	17-JUN-2014	✓	31-DEC-2013	17-JUN-2014	✓



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EG035F: Dissolved Mercury by FIMS</b>							
Clear Plastic Bottle - Filtered; Lab-acidified (EG035F) MH_X_4/D8	18-DEC-2013	---	15-JAN-2014	----	31-DEC-2013	15-JAN-2014	✓
Clear Plastic Bottle - Filtered; Lab-acidified (EG035F) ML_MW15, ML_MW05, ML_MW10, DUP01_191213DB	19-DEC-2013	---	16-JAN-2014	----	31-DEC-2013	16-JAN-2014	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>							
Clear Plastic Bottle - Unspecified; Lab-acidified (EG035T) R01_191213DB	19-DEC-2013	----	----	----	24-DEC-2013	16-JAN-2014	✓
<b>EG051G: Ferrous Iron by Discrete Analyser</b>							
Clear Plastic Bottle - HCl - Filtered (EG051G) MH_X_4/D8	18-DEC-2013	----	----	----	24-DEC-2013	25-DEC-2013	✓
Clear Plastic Bottle - HCl - Filtered (EG051G) ML_MW15, ML_MW05, ML_MW10, DUP01_191213DB	19-DEC-2013	----	----	----	24-DEC-2013	26-DEC-2013	✓
<b>EK040P: Fluoride by PC Titrator</b>							
Clear Plastic Bottle - Natural (EK040P) MH_X_4/D8	18-DEC-2013	---	15-JAN-2014	----	21-DEC-2013	15-JAN-2014	✓
Clear Plastic Bottle - Natural (EK040P) ML_MW15, ML_MW05, ML_MW10, DUP01_191213DB	19-DEC-2013	---	16-JAN-2014	----	21-DEC-2013	16-JAN-2014	✓
<b>EP066: Polychlorinated Biphenyls (PCB)</b>							
Amber Glass Bottle - Unpreserved (EP066) ML_MW15, ML_MW05, ML_MW10, DUP01_191213DB	19-DEC-2013	24-DEC-2013	26-DEC-2013	✓	03-JAN-2014	09-FEB-2014	✓
<b>EP080/071: Total Petroleum Hydrocarbons</b>							
Amber Glass Bottle - Unpreserved (EP071) MH_X_4/D8	18-DEC-2013	24-DEC-2013	25-DEC-2013	✓	02-JAN-2014	09-FEB-2014	✓
Amber Glass Bottle - Unpreserved (EP071) ML_MW15, ML_MW05, R01_191213DB, ML_MW10, DUP01_191213DB,	19-DEC-2013	24-DEC-2013	26-DEC-2013	✓	02-JAN-2014	09-FEB-2014	✓
<b>EP074D: Fumigants</b>							
Amber VOC Vial - Sulfuric Acid (EP074) ML_MW15, ML_MW05, ML_MW10, DUP01_191213DB	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>EP074E: Halogenated Aliphatic Compounds</b>							
Amber VOC Vial - Sulfuric Acid (EP074) ML_MW15, ML_MW05, ML_MW10, DUP01_191213DB	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP074F: Halogenated Aromatic Compounds</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> ML_MW15, ML_MW05, ML_MW10, DUP01_191213DB	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> ML_MW15, ML_MW05, ML_MW10, DUP01_191213DB	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>EP074H: Naphthalene</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> ML_MW15, ML_MW05, ML_MW10, DUP01_191213DB	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>EP074B: Oxygenated Compounds</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> ML_MW15, ML_MW05, ML_MW10, DUP01_191213DB	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>EP074C: Sulfonated Compounds</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> ML_MW15, ML_MW05, ML_MW10, DUP01_191213DB	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>EP074G: Trihalomethanes</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> ML_MW15, ML_MW05, ML_MW10, DUP01_191213DB	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>EP075(SIM)A: Phenolic Compounds</b>							
<b>Amber Glass Bottle - Unpreserved (EP075(SIM))</b> MH_X_4/D8	18-DEC-2013	24-DEC-2013	25-DEC-2013	✓	03-JAN-2014	09-FEB-2014	✓
<b>Amber Glass Bottle - Unpreserved (EP075(SIM))</b> ML_MW15, ML_MW05, ML_MW10, DUP01_191213DB	19-DEC-2013	24-DEC-2013	26-DEC-2013	✓	03-JAN-2014	09-FEB-2014	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>							
<b>Amber Glass Bottle - Unpreserved (EP075(SIM))</b> MH_X_4/D8	18-DEC-2013	24-DEC-2013	25-DEC-2013	✓	03-JAN-2014	09-FEB-2014	✓
<b>Amber Glass Bottle - Unpreserved (EP075(SIM))</b> ML_MW15, ML_MW05, ML_MW10, DUP01_191213DB	19-DEC-2013	24-DEC-2013	26-DEC-2013	✓	03-JAN-2014	09-FEB-2014	✓



Matrix: **WATER** Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP080: BTEXN</b>							
Amber VOC Vial - Sulfuric Acid (EP080) MH_X_4/D8	18-DEC-2013	28-DEC-2013	01-JAN-2014	✓	28-DEC-2013	01-JAN-2014	✓
Amber VOC Vial - Sulfuric Acid (EP080) ML_MW15, ML_MW05, ML_MW10, DUP01_191213DB	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
Amber VOC Vial - Sulfuric Acid (EP080) R01_191213DB, TB, TS,	19-DEC-2013	31-DEC-2013	02-JAN-2014	✓	31-DEC-2013	02-JAN-2014	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>							
Amber VOC Vial - Sulfuric Acid (EP080) MH_X_4/D8	18-DEC-2013	28-DEC-2013	01-JAN-2014	✓	28-DEC-2013	01-JAN-2014	✓
Amber VOC Vial - Sulfuric Acid (EP080) ML_MW15, ML_MW05, ML_MW10, DUP01_191213DB	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
Amber VOC Vial - Sulfuric Acid (EP080) R01_191213DB, TB	19-DEC-2013	31-DEC-2013	02-JAN-2014	✓	31-DEC-2013	02-JAN-2014	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: ✘ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Reaular	Actual	Expected	Evaluation	
<b>Laboratory Duplicates (DUP)</b>							
Alkalinity by PC Titrator	ED037-P	4	39	10.3	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	20	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	2	13	15.4	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	16	12.5	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	2	20	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	2	20	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	20	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	12	8.3	10.0	✘	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	11	9.1	10.0	✘	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	8	12.5	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	2	17	11.8	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	20	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	4	38	10.5	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	18	11.1	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
Alkalinity by PC Titrator	ED037-P	2	39	5.1	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	20	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	13	7.7	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	16	6.3	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	12	8.3	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	11	9.1	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	8	12.5	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	17	5.9	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	38	5.3	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	18	5.6	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
Chloride by Discrete Analyser	ED045G	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	13	7.7	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	16	6.3	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement





Matrix: **WATER** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Method Blanks (MB) - Continued</b>							
Fluoride by PC Titrator	EK040P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	38	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
Chloride by Discrete Analyser	ED045G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	13	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	16	6.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	38	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Sulfate (Turbidimetric) as SO <sub>4</sub> <sup>2-</sup> by Discrete Analyser	ED041G	WATER	APHA 21st ed., 4500-SO <sub>4</sub> Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> <sup>2-</sup> concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Chloride by Discrete Analyser	ED045G	WATER	APHA 21st ed., 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	Major Cations is determined based on APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um filtered sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Hardness parameters are calculated based on APHA 21st ed., 2340 B. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): Samples are 0.45 um filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) Samples are 0.45 um filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)



Analytical Methods	Method	Matrix	Method Descriptions
Total Mercury by FIMS	EG035T	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Ferrous Iron by Discrete Analyser	EG051G	WATER	APHA 21st ed., 3500 Fe-B. A colorimetric determination based on the reaction between phenanthroline and ferrous iron at pH 3.2-3.3 to form an orange-red complex that is measured against a five-point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Fluoride by PC Titrator	EK040P	WATER	APHA 21st ed., 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by Turbi SO4 by DA. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Polychlorinated Biphenyls (PCB)	EP066	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
TPH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Volatile Organic Compounds	EP074	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
TPH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals	EN25	WATER	USEPA SW846-3005 Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Lab Acidification of Metals	EN80	WATER	USEPA Method 200.8
Lab Acidification of Dissolved Metals	EN80F	WATER	US EPA Method 200.8
Separatory Funnel Extraction of Liquids	ORG14	WATER	USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.



## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Laboratory Control Spike (LCS) Recoveries</b>							
EP075(SIM)A: Phenolic Compounds	3852784-018	----	2-Chlorophenol	95-57-8	62.5 %	63.8-110%	Recovery less than lower control limit
<b>Matrix Spike (MS) Recoveries</b>							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	ES1327849-001	Anonymous	Sulfate as SO4 - Turbidimetric	14808-79-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG020F: Dissolved Metals by ICP-MS	ES1327988-002	ML_MW15	Manganese	7439-96-5	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.

#### Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- No Analysis Holding Time Outliers exist.

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

Matrix: **WATER**

Quality Control Sample Type Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
<b>Laboratory Duplicates (DUP)</b>					
PAH/Phenols (GC/MS - SIM)	1	12	8.3	10.0	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	1	11	9.1	10.0	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

**Work Order** : **ES1327988**

**Amendment** : **1**

**Client** : **ENVIRO RESOURCES MANAGEMENT**      **Laboratory** : Environmental Division Sydney

**Contact** : MR JONATHAN LEKAWSKI      **Contact** : Barbara Hanna  
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 LOCKED BAG 24  
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**Facsimile** : +61 02 8584 8800      **Facsimile** : +61 2 8784 8555

**Project** : SYMPHONY DELTA WEST      **Page** : 1 of 3

**Order number** : 0207420/0207423      **Quote number** : ES2013ENVRES0360 (SY/551/13 V4)

**C-O-C number** : ----

**Site** : ----

**Sampler** : DB      **QC Level** : NEPM 2013 Schedule B(3) and ALS QCS3 requirement

#### Dates

**Date Samples Received** : 20-DEC-2013      **Issue Date** : 28-JAN-2014 09:50  
**Client Requested Due Date** : 06-JAN-2014      **Scheduled Reporting Date** : **06-JAN-2014**

#### Delivery Details

**Mode of Delivery** : Carrier      **Temperature** : 2.5°C - Ice present  
**No. of coolers/boxes** : 7 HARD      **No. of samples received** : 8  
**Security Seal** : Intact.      **No. of samples analysed** : 8

#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

### Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EG020F Dissolved Metals by ICPMS	WATER - EG051G Ferrous Iron by Discrete Analyser	WATER - EK040-P Fluoride(PC)	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP066-PCB-WA Polychlorinated Biphenyls (PCB)	WATER - EP074 (water) Volatile Organic Compounds	WATER - EP080 BTEXN	WATER - NT-01 Major Cations (Ca, Mg, Na, K)
ES1327988-001	18-DEC-2013 15:00	MH_X_4/D8	✓	✓	✓	✓				✓
ES1327988-002	19-DEC-2013 15:00	ML_MW15	✓	✓	✓	✓	✓	✓		✓
ES1327988-003	19-DEC-2013 15:00	ML_MW10	✓	✓	✓	✓	✓	✓		✓
ES1327988-004	19-DEC-2013 15:00	ML_MW05	✓	✓	✓	✓	✓	✓		✓
ES1327988-005	19-DEC-2013 15:00	DUP01_191213DB	✓	✓	✓	✓	✓	✓		✓
ES1327988-007	19-DEC-2013 15:00	TS							✓	

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)	WATER - W-02 8 Metals	WATER - W-02T 8 metals (Total)	WATER - W-04 TPH/BTEX	WATER - W-18 TRH(C6 - C9)/BTEXN	WATER - W-24 TPH/BTEX/PAH/Phenols
ES1327988-001	18-DEC-2013 15:00	MH_X_4/D8	✓	✓				✓
ES1327988-002	19-DEC-2013 15:00	ML_MW15	✓	✓				✓
ES1327988-003	19-DEC-2013 15:00	ML_MW10	✓	✓				✓
ES1327988-004	19-DEC-2013 15:00	ML_MW05	✓	✓				✓
ES1327988-005	19-DEC-2013 15:00	DUP01_191213DB	✓	✓				✓
ES1327988-006	19-DEC-2013 15:00	R01_191213DB			✓	✓		
ES1327988-008	19-DEC-2013 15:00	TB					✓	

### Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV ) Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA ) Email jonathan.lekawski@erm.com  
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI ) Email jonathan.lekawski@erm.com  
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC ) Email jonathan.lekawski@erm.com  
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN ) Email jonathan.lekawski@erm.com  
- Chain of Custody (CoC) ( COC ) Email jonathan.lekawski@erm.com  
- EDI Format - ENMRG ( ENMRG ) Email jonathan.lekawski@erm.com  
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM ) Email jonathan.lekawski@erm.com  
- EDI Format - ESDAT ( ESDAT ) Email jonathan.lekawski@erm.com  
- EDI Format - XTab ( XTAB ) Email jonathan.lekawski@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA ) Email symphony.deltawest@erm.com  
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI ) Email symphony.deltawest@erm.com  
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC ) Email symphony.deltawest@erm.com  
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN ) Email symphony.deltawest@erm.com  
- A4 - AU Tax Invoice ( INV ) Email symphony.deltawest@erm.com  
- Chain of Custody (CoC) ( COC ) Email symphony.deltawest@erm.com  
- EDI Format - ENMRG ( ENMRG ) Email symphony.deltawest@erm.com  
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM ) Email symphony.deltawest@erm.com  
- EDI Format - ESDAT ( ESDAT ) Email symphony.deltawest@erm.com

### SYMPHONY ERARING

- \*AU Certificate of Analysis - NATA ( COA ) Email Symphony.Eraring@erm.com  
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI ) Email Symphony.Eraring@erm.com  
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC ) Email Symphony.Eraring@erm.com  
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN ) Email Symphony.Eraring@erm.com  
- A4 - AU Tax Invoice ( INV ) Email Symphony.Eraring@erm.com  
- Chain of Custody (CoC) ( COC ) Email Symphony.Eraring@erm.com  
- EDI Format - ENMRG ( ENMRG ) Email Symphony.Eraring@erm.com  
- EDI Format - ESDAT ( ESDAT ) Email Symphony.Eraring@erm.com  
- EDI Format - XTab ( XTAB ) Email Symphony.Eraring@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV ) Email au.accounts@erm.com





**CHAIN OF CUSTODY**  
AL9 Laboratory  
please tick ✓

200 STATION ST, Broomfield, Victoria 3083  
Ph: 03 9499 2200  
Fax: 03 9499 2201  
www.al9.com.au

AL9 Laboratory  
1000 St Albans Rd, St Albans, Vic 3021  
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AL9 Laboratory  
1000 St Albans Rd, St Albans, Vic 3021  
Ph: 03 9499 2200  
Fax: 03 9499 2201

CLIENT: **ERIN** TURNAROUND REQUIREMENTS:  Standard TAT (last date date)  Not Standard or urgent TAT (last date date)

OFFICE: **GROUND FLOOR, 32 SAUNDERS ST, PYRMONT NSW 2009** (Standard TAT may be longer for some tests e.g. Urea, Toxic Screen)

PROJECT: **Symphony - Delta West** ALB QUOTE NO.: **SV18/13 VA**

ORDER NUMBER: **02074620900000000000** CONTRACT PH: **084 8808**

PROJECT MANAGER: **Jonathan Lawson** CONTRACTOR: **0207795671**

SAMPLER: **D Brodies** BOD FORMAT (or default): **ESDATT/PC/MS**

COG applied to ALB? **(Yes / No)** Email Reports to (will default to PM if no other addresses are listed): **Symphony, DeltaWest@erim.com**

Email Invoiced to (will default to PM if no other addresses are listed): **Symphony, DeltaWest@erim.com**

RELIQUISHED BY: **D Brodies** DATE/TIME: **19/12/13**

RELIQUISHED BY: **Steven** DATE/TIME: **20/12/13 8:30**

RELIQUISHED BY: **Steven** DATE/TIME: **20/12/13 8:30**

RELIQUISHED BY: **Steven** DATE/TIME: **20/12/13 8:30**

RELIQUISHED BY: **Steven** DATE/TIME: **20/12/13 8:30**

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RELIQUISHED BY: **Steven** DATE/TIME: **20/12/13 8:30**

RELIQUISHED BY: **Steven** DATE/TIME: **20/12/13 8:30**

LAB ID	SAMPLE ID	DATE / TIME	VOLUME	TYPE & PRESERVATIVE (check policy)	total to (refer to)	TOTAL CONTAINERS	W-4 (TPH/TRH) (C36 or 48) / BTEXM	8 Ultra Trace Dissolved Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, etc)	Additional Metals Ultra Trace - Se, So, Fe, Mn	Ferrous Iron	PAH/Phenols	VOC Scan	PCB	Cations/Anions	Additional Information
1	ML-X-4/08	18/12/13				6	X	X	X	X	X	X	X	X	
2	ML-MM15	19/12/13				6	X	X	X	X	X	X	X	X	
3	ML-MM10					6	X	X	X	X	X	X	X	X	
4	ML-MM05					6	X	X	X	X	X	X	X	X	
5	Dup01-1912/3DB					6	X	X	X	X	X	X	X	X	
6	R01-1912/3DB					4	X	X	X	X	X	X	X	X	
7	TS					2	X	X	X	X	X	X	X	X	
8	TB					2	X	X	X	X	X	X	X	X	

Environmental Division  
Sydney  
Work Order  
**ES1327988**



Telephone: + 61-2-8784 8555

AL9 Laboratory  
1000 St Albans Rd, St Albans, Vic 3021  
Ph: 03 9499 2200  
Fax: 03 9499 2201

## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>ES1327997</b> <b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : MR JONATHAN LEKAWSKI <b>Address</b> : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007  <b>E-mail</b> : jonathan.lekawski@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800 <b>Project</b> : SYMPHONY DELTA WEST <b>Order number</b> : 0207420/0207423 <b>C-O-C number</b> : ---- <b>Sampler</b> : CF <b>Site</b> : ----  <b>Quote number</b> : SY/551/13 V4	<b>Page</b> : 1 of 9  <b>Laboratory</b> : Environmental Division Sydney <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164  <b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555 <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement  <b>Date Samples Received</b> : 20-DEC-2013 <b>Issue Date</b> : 06-JAN-2014  <b>No. of samples received</b> : 5 <b>No. of samples analysed</b> : 4
--	---

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Raymond Commodor	Instrument Chemist	Sydney Inorganics



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### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EP080: Sample TRIP SPIKE contains volatile compounds spiked into the sample containers prior to dispatch from the laboratory. BTEX compounds spiked at 20 ug/L.**



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MK_MW10	ML_MW20	TS4	TB4	----
				19-DEC-2013 08:55	19-DEC-2013 10:23	19-DEC-2013 15:00	19-DEC-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1327997-001	ES1327997-002	ES1327997-003	ES1327997-004	----
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	173	161	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	173	161	----	----	----
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	68	249	----	----	----
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	10	21	----	----	----
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	50	73	----	----	----
Magnesium	7439-95-4	1	mg/L	23	51	----	----	----
Sodium	7440-23-5	1	mg/L	16	26	----	----	----
Potassium	7440-09-7	1	mg/L	10	11	----	----	----
<b>EG020F: Dissolved Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	0.013	<0.001	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	----	----	----
Nickel	7440-02-0	0.001	mg/L	0.009	0.117	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	----	----	----
Zinc	7440-66-6	0.005	mg/L	0.008	0.087	----	----	----
Manganese	7439-96-5	0.001	mg/L	1.03	2.08	----	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	----	----	----
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	----	----	----
<b>EG035F: Dissolved Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	----	----	----
<b>EG051G: Ferrous Iron by Discrete Analyser</b>								
Ferrous Iron	----	0.05	mg/L	0.07	5.61	----	----	----
<b>EK040P: Fluoride by PC Titrator</b>								
Fluoride	16984-48-8	0.1	mg/L	0.5	0.1	----	----	----
<b>EN055: Ionic Balance</b>								
Total Anions	----	0.01	meq/L	5.15	8.99	----	----	----
Total Cations	----	0.01	meq/L	5.34	9.25	----	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MK_MW10	ML_MW20	TS4	TB4	----
				19-DEC-2013 08:55	19-DEC-2013 10:23	19-DEC-2013 15:00	19-DEC-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1327997-001	ES1327997-002	ES1327997-003	ES1327997-004	----
<b>EN055: Ionic Balance - Continued</b>								
Ionic Balance	----	0.01	%	1.77	1.42	----	----	----
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	1	µg/L	<1	<1	----	----	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	5	µg/L	<5	<5	----	----	----
Isopropylbenzene	98-82-8	5	µg/L	<5	<5	----	----	----
n-Propylbenzene	103-65-1	5	µg/L	<5	<5	----	----	----
1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	----	----	----
sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	----	----	----
1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	----	----	----
tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	----	----	----
p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	----	----	----
n-Butylbenzene	104-51-8	5	µg/L	<5	<5	----	----	----
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	50	µg/L	<50	<50	----	----	----
2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	----	----	----
2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	----	----	----
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	5	µg/L	<5	<5	----	----	----
<b>EP074D: Fumigants</b>								
2.2-Dichloropropane	594-20-7	5	µg/L	<5	<5	----	----	----
1.2-Dichloropropane	78-87-5	5	µg/L	<5	<5	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	----	----	----
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	----	----	----
Chloromethane	74-87-3	50	µg/L	<50	<50	----	----	----
Vinyl chloride	75-01-4	50	µg/L	<50	<50	----	----	----
Bromomethane	74-83-9	50	µg/L	<50	<50	----	----	----
Chloroethane	75-00-3	50	µg/L	<50	<50	----	----	----
Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	----	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MK_MW10	ML_MW20	TS4	TB4	----
				19-DEC-2013 08:55	19-DEC-2013 10:23	19-DEC-2013 15:00	19-DEC-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1327997-001	ES1327997-002	ES1327997-003	ES1327997-004	----
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	----	----	----
Iodomethane	74-88-4	5	µg/L	<5	<5	----	----	----
trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	----	----	----
1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	----	----	----
cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	----	----	----
1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	----	----	----
1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	----	----	----
Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	----	----	----
1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	----	----	----
Trichloroethene	79-01-6	5	µg/L	<5	<5	----	----	----
Dibromomethane	74-95-3	5	µg/L	<5	<5	----	----	----
1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	----	----	----
1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	----	----	----
Tetrachloroethene	127-18-4	5	µg/L	<5	<5	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	----	----	----
1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	----	----	----
Pentachloroethane	76-01-7	5	µg/L	<5	<5	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	----	----	----
Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	----	----	----
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	5	µg/L	<5	<5	----	----	----
Bromobenzene	108-86-1	5	µg/L	<5	<5	----	----	----
2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	----	----	----
4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	----	----	----
1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	----	----	----
1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	----	----	----
1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	----	----	----
1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	----	----	----
1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	----	----	----
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	5	µg/L	<5	<5	----	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				MK_MW10	ML_MW20	TS4	TB4	----
Client sampling date / time				19-DEC-2013 08:55	19-DEC-2013 10:23	19-DEC-2013 15:00	19-DEC-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1327997-001	ES1327997-002	ES1327997-003	ES1327997-004	----
<b>EP074G: Trihalomethanes - Continued</b>								
Bromodichloromethane	75-27-4	5	µg/L	<5	<5	----	----	----
Dibromochloromethane	124-48-1	5	µg/L	<5	<5	----	----	----
Bromoform	75-25-2	5	µg/L	<5	<5	----	----	----
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	7	µg/L	<7	<7	----	----	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	----	----	----
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	----	----	----
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	----	----	----
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	----	----	----
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	----	----	----
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	----	----	----
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	----	----	----
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	----	----	----
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	----	----	----
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	----	----	----
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	----	----	----
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	----	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	----	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	----	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	----	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	----	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	----	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	----	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	----	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	----	----	----
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	----	----	----





## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MK_MW10	ML_MW20	TS4	TB4	----
				19-DEC-2013 08:55	19-DEC-2013 10:23	19-DEC-2013 15:00	19-DEC-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1327997-001	ES1327997-002	ES1327997-003	ES1327997-004	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	----	----	----
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	----	----	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	20	µg/L	<20	<20	----	<20	----
C10 - C14 Fraction	----	50	µg/L	<50	<50	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	----	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	----	<20	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	----	<20	----
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	<100	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	----	----	----
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	<1	<1	18	<1	----
Toluene	108-88-3	2	µg/L	<2	<2	19	<2	----
Ethylbenzene	100-41-4	2	µg/L	<2	<2	18	<2	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	18	<2	----
ortho-Xylene	95-47-6	2	µg/L	<2	<2	19	<2	----
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	37	<2	----
^ Sum of BTEX	----	1	µg/L	<1	<1	92	<1	----
Naphthalene	91-20-3	5	µg/L	<5	<5	20	<5	----
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	59.0	75.1	----	----	----
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	106	113	----	----	----
Toluene-D8	2037-26-5	0.1	%	103	105	----	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				MK_MW10	ML_MW20	TS4	TB4	----
				19-DEC-2013 08:55	19-DEC-2013 10:23	19-DEC-2013 15:00	19-DEC-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1327997-001	ES1327997-002	ES1327997-003	ES1327997-004	----
<b>EP074S: VOC Surrogates - Continued</b>								
4-Bromofluorobenzene	460-00-4	0.1	%	92.4	92.3	----	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	15.3	16.4	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	35.2	34.4	----	----	----
2,4,6-Tribromophenol	118-79-6	0.1	%	48.0	53.9	----	----	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	47.9	39.4	----	----	----
Anthracene-d10	1719-06-8	0.1	%	57.2	66.6	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	63.2	71.8	----	----	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	120	128	115	97.3	----
Toluene-D8	2037-26-5	0.1	%	101	104	120	99.2	----
4-Bromofluorobenzene	460-00-4	0.1	%	94.7	97.5	117	97.1	----



## Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP066S: PCB Surrogate</b>			
Decachlorobiphenyl	2051-24-3	28.5	129
<b>EP074S: VOC Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	78.3	133.2
Toluene-D8	2037-26-5	79.1	128.9
4-Bromofluorobenzene	460-00-4	80.8	123.7
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	10.0	44
2-Chlorophenol-D4	93951-73-6	14	94
2,4,6-Tribromophenol	118-79-6	17	125
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27.4	113
4-Terphenyl-d14	1718-51-0	32	112
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: ES1327997</b>	<b>Page</b>	: 1 of 21
<b>Client</b>	<b>: ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	<b>: MR JONATHAN LEKAWSKI</b>	<b>Contact</b>	: Barbara Hanna
<b>Address</b>	<b>: GROUND FLOOR</b>	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
	<b>33 SAUNDERS STREET, PYRMONT NSW 2009</b>		
	<b>LOCKED BAG 24</b>		
	<b>BROADWAY NSW, AUSTRALIA 2007</b>		
<b>E-mail</b>	<b>: jonathan.lekawski@erm.com</b>	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	<b>: +61 02 8584 8888</b>	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	<b>: +61 02 8584 8800</b>	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	<b>: SYMPHONY DELTA WEST</b>	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b>	<b>: ----</b>		
<b>C-O-C number</b>	<b>: ----</b>	<b>Date Samples Received</b>	: 20-DEC-2013
<b>Sampler</b>	<b>: CF</b>	<b>Issue Date</b>	: 06-JAN-2014
<b>Order number</b>	<b>: 0207420/0207423</b>		
<b>Quote number</b>	<b>: SY/551/13 V4</b>	<b>No. of samples received</b>	: 5
		<b>No. of samples analysed</b>	: 4

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Raymond Commodor	Instrument Chemist	Sydney Inorganics



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### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :            Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
                  CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
                  LOR = Limit of reporting  
                  RPD = Relative Percentage Difference  
                  # = Indicates failed QC



## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>ED037P: Alkalinity by PC Titrator (QC Lot: 3225580)</b>									
ES1327988-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	657	661	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	657	661	0.6	0% - 20%
ES1327989-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	98	99	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	98	99	0.0	0% - 20%
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3227256)</b>									
ES1327989-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	108	107	0.0	0% - 20%
ES1328003-005	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	160	161	0.9	0% - 20%
<b>ED045G: Chloride Discrete analyser (QC Lot: 3227255)</b>									
ES1327989-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	100	97	3.0	0% - 20%
ES1328003-005	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	34	32	8.0	0% - 20%
<b>ED093F: Dissolved Major Cations (QC Lot: 3227254)</b>									
ES1327989-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	21	21	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	25	25	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	78	78	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	8	8	0.0	No Limit
ES1328003-006	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	17	16	0.0	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	13	13	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	33	33	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	6	6	0.0	No Limit
<b>EG020F: Dissolved Metals by ICP-MS (QC Lot: 3232982)</b>									
ES1327988-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0006	0.0006	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	3.96	3.90	1.5	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.218	0.209	4.1	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.153	0.158	3.2	0% - 20%
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	0.10	0.09	0.0	No Limit
ES1327999-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG020F: Dissolved Metals by ICP-MS (QC Lot: 3232982) - continued</b>									
ES1327999-001	Anonymous	EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.022	0.020	10.3	0% - 20%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.035	0.033	5.0	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.009	0.008	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	0.08	0.08	0.0	No Limit
<b>EG035F: Dissolved Mercury by FIMS (QC Lot: 3232981)</b>									
ES1327840-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1327997-001	MK_MW10	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
<b>EG051G: Ferrous Iron by Discrete Analyser (QC Lot: 3229114)</b>									
ES1327935-006	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	13.3	13.5	1.5	0% - 20%
ES1327989-002	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	11.8	11.8	0.09	0% - 20%
<b>EK040P: Fluoride by PC Titrator (QC Lot: 3225581)</b>									
ES1327989-002	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
ES1328000-002	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.0	No Limit
<b>EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 3227667)</b>									
ES1328000-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	1	µg/L	<1	<1	0.0	No Limit
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3229797)</b>									
ES1327989-001	Anonymous	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
ES1328001-001	Anonymous	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit





Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074B: Oxygenated Compounds (QC Lot: 3229797)</b>									
ES1327989-001	Anonymous	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
ES1328001-001	Anonymous	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
<b>EP074C: Sulfonated Compounds (QC Lot: 3229797)</b>									
ES1327989-001	Anonymous	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
ES1328001-001	Anonymous	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
<b>EP074D: Fumigants (QC Lot: 3229797)</b>									
ES1327989-001	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
ES1328001-001	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3229797)</b>									
ES1327989-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3229797) - continued</b>									
ES1327989-001	Anonymous	EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit		
ES1328001-001	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit

**EP074F: Halogenated Aromatic Compounds (QC Lot: 3229797)**



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report							
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)		
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3229797) - continued</b>											
ES1327989-001	Anonymous	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit		
ES1328001-001	Anonymous	EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit		
<b>EP074G: Trihalomethanes (QC Lot: 3229797)</b>	Anonymous	EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit		
		ES1328001-001	Anonymous	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
				EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
EP074: Dibromochloromethane	124-48-1			5	µg/L	<5	<5	0.0	No Limit		
EP074: Bromoform	75-25-2			5	µg/L	<5	<5	0.0	No Limit		
<b>EP074H: Naphthalene (QC Lot: 3229797)</b>											
ES1327989-001	Anonymous	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit		
ES1328001-001	Anonymous	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit		
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3227669)</b>											
ES1328000-001	Anonymous	EP075(SIM): Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit		
		EP075(SIM): 2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit		
		EP075(SIM): 2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit		
		EP075(SIM): 2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit		
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit		
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit		
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit		
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit		
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit		



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3227669) - continued</b>									
ES1328000-001	Anonymous	EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	0.0	No Limit
ES1328000-004	Anonymous	EP075(SIM): Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	0.0	No Limit
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3227669)</b>									
ES1328000-001	Anonymous	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Indeno(1,2,3-cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit		
ES1328000-004	Anonymous	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3227669) - continued</b>									
ES1328000-004	Anonymous	EP075(SIM): Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3227668)</b>									
ES1328000-001	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
ES1328000-004	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3229798)</b>									
ES1327989-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1328001-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3229802)</b>									
ES1327901-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1328000-002	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3227668)</b>									
ES1328000-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
ES1328000-004	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3229798)</b>									
ES1327989-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES1328001-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3229802)</b>									
ES1327901-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES1328000-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3229798)</b>									
ES1327989-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP080: BTEXN (QC Lot: 3229798) - continued</b>									
ES1327989-001	Anonymous	EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
ES1328001-001	Anonymous	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
	91-20-3	5	µg/L	<5	<5	0.0	No Limit		
<b>EP080: BTEXN (QC Lot: 3229802)</b>									
ES1327901-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
ES1328000-002	Anonymous	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
	91-20-3	5	µg/L	<5	<5	0.0	No Limit		



### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
<b>ED037P: Alkalinity by PC Titrator (QCLot: 3225580)</b>								
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	----	200 mg/L	97.3	81	111
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3227256)</b>								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	102	86	122
<b>ED045G: Chloride Discrete analyser (QCLot: 3227255)</b>								
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	97.6	77	123
<b>ED093F: Dissolved Major Cations (QCLot: 3227254)</b>								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	87	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	89	113
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	101	79	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	102	87	115
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3232982)</b>								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	84.3	80	118
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	91.5	82	112
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	90.4	81	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	89.2	80	112
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	87.2	83	111
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	89.9	81	113
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	89.3	81	113
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	83.2	73	125
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	87.8	80	116
EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.1 mg/L	96.8	69	123
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3232981)</b>								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	99.8	78	114
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3229114)</b>								
EG051G: Ferrous Iron	----	0.10	mg/L	<0.10	2.00 mg/L	101	89	113
<b>EK040P: Fluoride by PC Titrator (QCLot: 3225581)</b>								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5.0 mg/L	94.8	75	119
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3227249)</b>								
EP066: Total Polychlorinated biphenyls	----	1	µg/L	<1	10 µg/L	75.6	61.6	107
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3227667)</b>								
EP066: Total Polychlorinated biphenyls	----	1	µg/L	<1	10 µg/L	103	61.6	107
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3229797)</b>								
EP074: Styrene	100-42-5	5	µg/L	<5	10 µg/L	104	74	118





Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3229797) - continued</b>									
EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	10 µg/L	108	75	121	
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	10 µg/L	111	67	123	
EP074: 1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	10 µg/L	107	70	122	
EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	10 µg/L	111	69	123	
EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	10 µg/L	109	71	121	
EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	10 µg/L	110	70	122	
EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	10 µg/L	109	67	123	
EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	10 µg/L	110	62	126	
<b>EP074B: Oxygenated Compounds (QCLot: 3229797)</b>									
EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	100 µg/L	104	61.4	134	
EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	100 µg/L	105	73.6	130	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	100 µg/L	104	61	139	
EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	100 µg/L	104	65	137	
<b>EP074C: Sulfonated Compounds (QCLot: 3229797)</b>									
EP074: Carbon disulfide	75-15-0	5	µg/L	<5	10 µg/L	97.2	72.8	127	
<b>EP074D: Fumigants (QCLot: 3229797)</b>									
EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	10 µg/L	103	61	119	
EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	10 µg/L	110	76	120	
EP074: cis-1,3-Dichloropropylene	10061-01-5	10	µg/L	<10	10 µg/L	91.7	62	120	
EP074: trans-1,3-Dichloropropylene	10061-02-6	10	µg/L	<10	10 µg/L	94.7	61	119	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	10 µg/L	105	69	117	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3229797)</b>									
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	100 µg/L	114	60.6	138	
EP074: Chloromethane	74-87-3	50	µg/L	<50	100 µg/L	118	67.4	130	
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	100 µg/L	# 130	69.4	129	
EP074: Bromomethane	74-83-9	50	µg/L	<50	100 µg/L	116	56	140	
EP074: Chloroethane	75-00-3	50	µg/L	<50	100 µg/L	123	63	135	
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	100 µg/L	119	65	131	
EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	10 µg/L	104	69	123	
EP074: Iodomethane	74-88-4	5	µg/L	<5	10 µg/L	102	70.2	128	
EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	10 µg/L	109	71	119	
EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	10 µg/L	112	75	119	
EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	10 µg/L	111	77	117	
EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	10 µg/L	103	61	119	
EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	10 µg/L	109	73	119	
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	10 µg/L	98.5	63	121	
EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	10 µg/L	118	78	122	
EP074: Trichloroethene	79-01-6	5	µg/L	<5	10 µg/L	107	74	120	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3229797) - continued</b>									
EP074: Dibromomethane	74-95-3	5	µg/L	<5	10 µg/L	105	74	118	
EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	10 µg/L	110	75	123	
EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	10 µg/L	107	79	121	
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	10 µg/L	108	72	124	
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	10 µg/L	95.5	66	114	
EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	10 µg/L	101	60	120	
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	10 µg/L	95.2	70.6	128	
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	10 µg/L	103	70	124	
EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	10 µg/L	113	74	128	
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	10 µg/L	87.4	71.8	126	
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	10 µg/L	86.1	66.4	136	
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	10 µg/L	117	58	132	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3229797)</b>									
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	10 µg/L	116	80	118	
EP074: Bromobenzene	108-86-1	5	µg/L	<5	10 µg/L	105	76	116	
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	10 µg/L	115	71	121	
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	10 µg/L	111	71	121	
EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	10 µg/L	112	74	120	
EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	10 µg/L	115	72	120	
EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	10 µg/L	110	77	117	
EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	10 µg/L	112	60	126	
EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	10 µg/L	118	67	125	
<b>EP074G: Trihalomethanes (QCLot: 3229797)</b>									
EP074: Chloroform	67-66-3	5	µg/L	<5	10 µg/L	113	76	118	
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	10 µg/L	100	64	118	
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	10 µg/L	95.3	65	115	
EP074: Bromoform	75-25-2	5	µg/L	<5	10 µg/L	90.9	73.5	126	
<b>EP074H: Naphthalene (QCLot: 3229797)</b>									
EP074: Naphthalene	91-20-3	7	µg/L	<7	10 µg/L	92.6	61	125	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3227248)</b>									
EP075(SIM): Phenol	108-95-2	0.2	µg/L	----	5 µg/L	39.6	24.5	61.9	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Chlorophenol	95-57-8	0.2	µg/L	----	5 µg/L	64.5	63.8	110	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Methylphenol	95-48-7	0.2	µg/L	----	5 µg/L	63.5	55.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	0.4	µg/L	----	10 µg/L	57.8	42.5	114	
		2	µg/L	<2.0	----	----	----	----	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3227248) - continued</b>									
EP075(SIM): 2-Nitrophenol	88-75-5	0.2	µg/L	----	5 µg/L	77.4	62.7	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.2	µg/L	----	5 µg/L	70.8	59.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.2	µg/L	----	5 µg/L	68.7	59.3	122	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.2	µg/L	----	5 µg/L	76.2	64.3	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.2	µg/L	----	5 µg/L	72.6	63	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.2	µg/L	----	5 µg/L	95.0	58.7	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.2	µg/L	----	5 µg/L	69.4	50	108	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Pentachlorophenol	87-86-5	0.4	µg/L	----	10 µg/L	85.5	8.7	95	
		2	µg/L	<2.0	----	----	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3227669)</b>									
EP075(SIM): Phenol	108-95-2	0.2	µg/L	----	5 µg/L	36.6	24.5	61.9	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Chlorophenol	95-57-8	0.2	µg/L	----	5 µg/L	64.6	63.8	110	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Methylphenol	95-48-7	0.2	µg/L	----	5 µg/L	66.4	55.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	0.4	µg/L	----	10 µg/L	60.3	42.5	114	
		2	µg/L	<2.0	----	----	----	----	
EP075(SIM): 2-Nitrophenol	88-75-5	0.2	µg/L	----	5 µg/L	71.9	62.7	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.2	µg/L	----	5 µg/L	66.4	59.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.2	µg/L	----	5 µg/L	85.5	59.3	122	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.2	µg/L	----	5 µg/L	76.0	64.3	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.2	µg/L	----	5 µg/L	67.8	63	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.2	µg/L	----	5 µg/L	81.4	58.7	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.2	µg/L	----	5 µg/L	81.8	50	108	
		1	µg/L	<1.0	----	----	----	----	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
					LCS	Low	High	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3227669) - continued</b>								
EP075(SIM): Pentachlorophenol	87-86-5	0.4	µg/L	----	10 µg/L	# 99.8	8.7	95
		2	µg/L	<2.0	----	----	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3227248)</b>								
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	5 µg/L	70.3	58.6	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	5 µg/L	84.7	63.6	114
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	5 µg/L	82.5	62.2	113
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	5 µg/L	90.8	63.9	115
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	5 µg/L	99.0	62.6	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	5 µg/L	97.0	64.3	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	5 µg/L	102	63.6	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	5 µg/L	101	63.1	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	5 µg/L	106	64.1	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	5 µg/L	96.7	62.5	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	5 µg/L	105	61.7	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	5 µg/L	105	61.7	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	5 µg/L	98.2	63.3	117
		0.5	µg/L	<0.5	----	----	----	----
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	5 µg/L	98.6	59.9	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	----	5 µg/L	98.0	61.2	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	----	5 µg/L	98.7	59.1	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	1	µg/L	<1.0	----	----	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3227669)</b>								
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	5 µg/L	70.8	58.6	119
		1	µg/L	<1.0	----	----	----	----



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3227669) - continued</b>									
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	5 µg/L	77.1	63.6	114	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	5 µg/L	73.5	62.2	113	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	5 µg/L	78.4	63.9	115	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	5 µg/L	94.8	62.6	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	5 µg/L	94.7	64.3	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	5 µg/L	106	63.6	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	5 µg/L	103	63.1	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	5 µg/L	98.6	64.1	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	5 µg/L	103	62.5	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	5 µg/L	95.1	61.7	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	5 µg/L	104	61.7	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	5 µg/L	89.0	63.3	117	
		0.5	µg/L	<0.5	----	----	----	----	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	5 µg/L	87.9	59.9	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	----	5 µg/L	84.5	61.2	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	----	5 µg/L	95.5	59.1	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	1	µg/L	<1.0	----	----	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3227247)</b>									
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	99.0	59	129	
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	104	71	131	
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	86.4	62	120	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3227668)</b>									
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	86.6	59	129	
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	106	71	131	
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	83.8	62	120	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229798)</b>									



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
						LCS	Low	High
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229798) - continued</b>								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	126	75	127
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229802)</b>								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	103	75	127
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3227247)</b>								
EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	2500 µg/L	88.7	58.9	131
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	95.0	73.9	138
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
		50	µg/L	----	1500 µg/L	101	67	127
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3227668)</b>								
EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	2500 µg/L	97.8	58.9	131
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	104	73.9	138
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
		50	µg/L	----	1500 µg/L	86.2	67	127
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229798)</b>								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	127	75	127
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229802)</b>								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	104	75	127
<b>EP080: BTEXN (QCLot: 3229798)</b>								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	123	70	124
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	118	65	129
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	112	70	120
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	111	69	121
	106-42-3							
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	112	72	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	109	70	124
<b>EP080: BTEXN (QCLot: 3229802)</b>								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	112	70	124
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	102	65	129
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	99.2	70	120
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	101	69	121
	106-42-3							
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	104	72	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	108	70	124

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.



Sub-Matrix: WATER

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3227256)</b>							
ES1327989-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130
<b>ED045G: Chloride Discrete analyser (QCLot: 3227255)</b>							
ES1327989-002	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	94.4	70	130
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3232982)</b>							
ES1327988-002	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	98.1	70	130
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	99.4	70	130
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	90.4	70	130
		EG020A-F: Copper	7440-50-8	0.2 mg/L	94.2	70	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	90.4	70	130
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	# Not Determined	70	130
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	89.4	70	130
EG020A-F: Zinc	7440-66-6	0.2 mg/L	97.4	70	130		
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3232981)</b>							
ES1327851-003	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	92.0	70	130
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3229114)</b>							
ES1327935-006	Anonymous	EG051G: Ferrous Iron	----	10 mg/L	92.0	68	128
<b>EK040P: Fluoride by PC Titrator (QCLot: 3225581)</b>							
ES1327989-002	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	103	70	130
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3227667)</b>							
ES1328000-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	10 µg/L	84.0	70	130
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3229797)</b>							
ES1327989-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	25 µg/L	110	70	130
		EP074: Trichloroethene	79-01-6	25 µg/L	120	70	130
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3229797)</b>							
ES1327989-001	Anonymous	EP074: Chlorobenzene	108-90-7	25 µg/L	125	70	130
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3227669)</b>							
ES1328000-001	Anonymous	EP075(SIM): Phenol	108-95-2	20 µg/L	40.8	20	130
		EP075(SIM): 2-Chlorophenol	95-57-8	20 µg/L	85.0	60	130
		EP075(SIM): 2-Nitrophenol	88-75-5	20 µg/L	83.2	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	20 µg/L	83.5	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	20 µg/L	69.5	20	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3227669)</b>							
ES1328000-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	20 µg/L	78.3	70	130
		EP075(SIM): Pyrene	129-00-0	20 µg/L	89.4	70	130





Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3227668)</b>							
ES1328000-001	Anonymous	EP071: C10 - C14 Fraction	----	200 µg/L	115	74	150
		EP071: C15 - C28 Fraction	----	300 µg/L	108	77	153
		EP071: C29 - C36 Fraction	----	200 µg/L	111	67	153
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229798)</b>							
ES1327989-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	112	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229802)</b>							
ES1327901-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	106	70	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3227668)</b>							
ES1328000-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	250 µg/L	98.8	74	150
		EP071: >C16 - C34 Fraction	----	350 µg/L	104	77	153
		EP071: >C34 - C40 Fraction	----	150 µg/L	111	67	153
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229798)</b>							
ES1327989-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	113	70	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229802)</b>							
ES1327901-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	108	70	130
<b>EP080: BTEXN (QCLot: 3229798)</b>							
ES1327989-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	109	70	130
		EP080: Toluene	108-88-3	25 µg/L	110	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	116	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	106	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	114	70	130
		EP080: Naphthalene	91-20-3	25 µg/L	113	70	130
<b>EP080: BTEXN (QCLot: 3229802)</b>							
ES1327901-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	107	70	130
		EP080: Toluene	108-88-3	25 µg/L	104	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	104	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	102	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	105	70	130
		EP080: Naphthalene	91-20-3	25 µg/L	101	70	130

**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report**

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report



Sub-Matrix: WATER

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>EK040P: Fluoride by PC Titrator (QCLot: 3225581)</b>										
ES1327989-002	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	103	----	70	130	----	----
<b>ED045G: Chloride Discrete analyser (QCLot: 3227255)</b>										
ES1327989-002	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	94.4	----	70	130	----	----
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3227256)</b>										
ES1327989-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	----	70	130	----	----
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3227667)</b>										
ES1328000-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	10 µg/L	84.0	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3227668)</b>										
ES1328000-001	Anonymous	EP071: C10 - C14 Fraction	----	200 µg/L	115	----	74	150	----	----
		EP071: C15 - C28 Fraction	----	300 µg/L	108	----	77	153	----	----
		EP071: C29 - C36 Fraction	----	200 µg/L	111	----	67	153	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3227668)</b>										
ES1328000-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	250 µg/L	98.8	----	74	150	----	----
		EP071: >C16 - C34 Fraction	----	350 µg/L	104	----	77	153	----	----
		EP071: >C34 - C40 Fraction	----	150 µg/L	111	----	67	153	----	----
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3227669)</b>										
ES1328000-001	Anonymous	EP075(SIM): Phenol	108-95-2	20 µg/L	40.8	----	20	130	----	----
		EP075(SIM): 2-Chlorophenol	95-57-8	20 µg/L	85.0	----	60	130	----	----
		EP075(SIM): 2-Nitrophenol	88-75-5	20 µg/L	83.2	----	60	130	----	----
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	20 µg/L	83.5	----	70	130	----	----
		EP075(SIM): Pentachlorophenol	87-86-5	20 µg/L	69.5	----	20	130	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3227669)</b>										
ES1328000-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	20 µg/L	78.3	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	20 µg/L	89.4	----	70	130	----	----
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3229114)</b>										
ES1327935-006	Anonymous	EG051G: Ferrous Iron	----	10 mg/L	92.0	----	68	128	----	----
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3229797)</b>										
ES1327989-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	25 µg/L	110	----	70	130	----	----
		EP074: Trichloroethene	79-01-6	25 µg/L	120	----	70	130	----	----
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3229797)</b>										
ES1327989-001	Anonymous	EP074: Chlorobenzene	108-90-7	25 µg/L	125	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229798)</b>										
ES1327989-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	112	----	70	130	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229798)</b>										
ES1327989-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	113	----	70	130	----	----
<b>EP080: BTEXN (QCLot: 3229798)</b>										



Sub-Matrix: WATER

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
					MS	MSD	Low	High	Value	Control Limit	
<b>EP080: BTEXN (QCLot: 3229798) - continued</b>											
ES1327989-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	109	----	70	130	----	----	
		EP080: Toluene	108-88-3	25 µg/L	110	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	25 µg/L	116	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	106	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	25 µg/L	114	----	70	130	----	----	
		EP080: Naphthalene	91-20-3	25 µg/L	113	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229802)</b>											
ES1327901-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	106	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229802)</b>											
ES1327901-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	108	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3229802)</b>											
ES1327901-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	107	----	70	130	----	----	
		EP080: Toluene	108-88-3	25 µg/L	104	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	25 µg/L	104	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	102	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	25 µg/L	105	----	70	130	----	----	
		EP080: Naphthalene	91-20-3	25 µg/L	101	----	70	130	----	----	
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3232981)</b>											
ES1327851-003	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	92.0	----	70	130	----	----	
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3232982)</b>											
ES1327988-002	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	98.1	----	70	130	----	----	
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	99.4	----	70	130	----	----	
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	90.4	----	70	130	----	----	
		EG020A-F: Copper	7440-50-8	0.2 mg/L	94.2	----	70	130	----	----	
		EG020A-F: Lead	7439-92-1	0.2 mg/L	90.4	----	70	130	----	----	
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	# Not Determined	----	70	130	----	----	
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	89.4	----	70	130	----	----	
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	97.4	----	70	130	----	----	

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1327997</b>	Page	: 1 of 9
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
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Project	: SYMPHONY DELTA WEST	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 20-DEC-2013
C-O-C number	: ----	Issue Date	: 06-JAN-2014
Sampler	: CF	No. of samples received	: 5
Order number	: 0207420/0207423	No. of samples analysed	: 4
Quote number	: SY/551/13 V4		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER** Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>ED037P: Alkalinity by PC Titrator</b>							
Clear Plastic Bottle - Natural (ED037-P) MK_MW10, ML_MW20	19-DEC-2013	---	02-JAN-2014	----	21-DEC-2013	02-JAN-2014	✓
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>							
Clear Plastic Bottle - Natural (ED041G) MK_MW10, ML_MW20	19-DEC-2013	---	16-JAN-2014	----	23-DEC-2013	16-JAN-2014	✓
<b>ED045G: Chloride Discrete analyser</b>							
Clear Plastic Bottle - Natural (ED045G) MK_MW10, ML_MW20	19-DEC-2013	---	16-JAN-2014	----	23-DEC-2013	16-JAN-2014	✓
<b>ED093F: Dissolved Major Cations</b>							
Clear Plastic Bottle - Natural (ED093F) MK_MW10, ML_MW20	19-DEC-2013	---	26-DEC-2013	----	23-DEC-2013	26-DEC-2013	✓
<b>EG020F: Dissolved Metals by ICP-MS</b>							
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F) MK_MW10, ML_MW20	19-DEC-2013	---	17-JUN-2014	----	31-DEC-2013	17-JUN-2014	✓
<b>EG035F: Dissolved Mercury by FIMS</b>							
Clear Plastic Bottle - Filtered; Lab-acidified (EG035F) MK_MW10, ML_MW20	19-DEC-2013	---	16-JAN-2014	----	31-DEC-2013	16-JAN-2014	✓
<b>EG051G: Ferrous Iron by Discrete Analyser</b>							
Clear Plastic Bottle - HCl - Filtered (EG051G) MK_MW10, ML_MW20	19-DEC-2013	----	----	----	24-DEC-2013	26-DEC-2013	✓
<b>EK040P: Fluoride by PC Titrator</b>							
Clear Plastic Bottle - Natural (EK040P) MK_MW10, ML_MW20	19-DEC-2013	---	16-JAN-2014	----	21-DEC-2013	16-JAN-2014	✓
<b>EP066: Polychlorinated Biphenyls (PCB)</b>							
Amber Glass Bottle - Unpreserved (EP066) MK_MW10	19-DEC-2013	23-DEC-2013	26-DEC-2013	✓	02-JAN-2014	11-FEB-2014	✓
Amber Glass Bottle - Unpreserved (EP066) ML_MW20	19-DEC-2013	23-DEC-2013	26-DEC-2013	✓	03-JAN-2014	12-FEB-2014	✓



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>							
Amber Glass Bottle - Unpreserved (EP071) MK_MW10	19-DEC-2013	23-DEC-2013	26-DEC-2013	✓	02-JAN-2014	11-FEB-2014	✓
Amber Glass Bottle - Unpreserved (EP071) ML_MW20	19-DEC-2013	23-DEC-2013	26-DEC-2013	✓	03-JAN-2014	12-FEB-2014	✓
<b>EP074D: Fumigants</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MK_MW10, ML_MW20	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>EP074E: Halogenated Aliphatic Compounds</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MK_MW10, ML_MW20	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>EP074F: Halogenated Aromatic Compounds</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MK_MW10, ML_MW20	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MK_MW10, ML_MW20	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>EP074H: Naphthalene</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MK_MW10, ML_MW20	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>EP074B: Oxygenated Compounds</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MK_MW10, ML_MW20	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>EP074C: Sulfonated Compounds</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MK_MW10, ML_MW20	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>EP074G: Trihalomethanes</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MK_MW10, ML_MW20	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>EP075(SIM)A: Phenolic Compounds</b>							
Amber Glass Bottle - Unpreserved (EP075(SIM)) MK_MW10	19-DEC-2013	23-DEC-2013	26-DEC-2013	✓	02-JAN-2014	11-FEB-2014	✓
Amber Glass Bottle - Unpreserved (EP075(SIM)) ML_MW20	19-DEC-2013	23-DEC-2013	26-DEC-2013	✓	03-JAN-2014	12-FEB-2014	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>							
Amber Glass Bottle - Unpreserved (EP075(SIM)) MK_MW10	19-DEC-2013	23-DEC-2013	26-DEC-2013	✓	02-JAN-2014	11-FEB-2014	✓
Amber Glass Bottle - Unpreserved (EP075(SIM)) ML_MW20	19-DEC-2013	23-DEC-2013	26-DEC-2013	✓	03-JAN-2014	12-FEB-2014	✓



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP080: BTEXN</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MK_MW10, ML_MW20	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓	
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> TS4, TB4	19-DEC-2013	31-DEC-2013	02-JAN-2014	✓	31-DEC-2013	02-JAN-2014	✓	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MK_MW10, ML_MW20	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓	
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> TB4	19-DEC-2013	31-DEC-2013	02-JAN-2014	✓	31-DEC-2013	02-JAN-2014	✓	





## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Alkalinity by PC Titrator	ED037-P	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	2	13	15.4	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	16	12.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	2	12	16.7	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	8	12.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	15	13.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	4	40	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
Alkalinity by PC Titrator	ED037-P	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	13	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	16	6.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	2	20	10.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	2	9	22.2	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	28	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
Chloride by Discrete Analyser	ED045G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	13	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	16	6.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	2	20	10.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	2	9	22.2	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



Matrix: **WATER** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Method Blanks (MB) - Continued</b>							
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	28	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
Chloride by Discrete Analyser	ED045G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	13	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	16	6.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	15	6.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Sulfate (Turbidimetric) as SO <sub>4</sub> <sup>2-</sup> by Discrete Analyser	ED041G	WATER	APHA 21st ed., 4500-SO <sub>4</sub> Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> <sup>2-</sup> concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Chloride by Discrete Analyser	ED045G	WATER	APHA 21st ed., 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	Major Cations is determined based on APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um filtered sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Hardness parameters are calculated based on APHA 21st ed., 2340 B. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): Samples are 0.45 um filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) Samples are 0.45 um filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Ferrous Iron by Discrete Analyser	EG051G	WATER	APHA 21st ed., 3500 Fe-B. A colorimetric determination based on the reaction between phenanthroline and ferrous iron at pH 3.2-3.3 to form an orange-red complex that is measured against a five-point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Fluoride by PC Titrator	EK040P	WATER	APHA 21st ed., 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)



Analytical Methods	Method	Matrix	Method Descriptions
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by Turbi SO4 by DA. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Polychlorinated Biphenyls (PCB)	EP066	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
TPH - Semivolatle Fraction	EP071	WATER	USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Volatile Organic Compounds	EP074	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
TPH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
Lab Acidification of Dissolved Metals	EN80F	WATER	US EPA Method 200.8
Separatory Funnel Extraction of Liquids	ORG14	WATER	USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.



## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Laboratory Control Spike (LCS) Recoveries</b>							
EP074E: Halogenated Aliphatic Compounds	3855103-002	----	Vinyl chloride	75-01-4	130 %	69.4-129%	Recovery greater than upper control limit
EP075(SIM)A: Phenolic Compounds	3852928-011	----	Pentachlorophenol	87-86-5	99.8 %	8.7-95%	Recovery greater than upper control limit
<b>Matrix Spike (MS) Recoveries</b>							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	ES1327989-002	Anonymous	Sulfate as SO4 - Turbidimetric	14808-79-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG020F: Dissolved Metals by ICP-MS	ES1327988-002	Anonymous	Manganese	7439-96-5	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.

#### Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- No Analysis Holding Time Outliers exist.

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

**Work Order : ES1327997**

<p><b>Client : ENVIRO RESOURCES MANAGEMENT</b></p> <p><b>Contact : MR JONATHAN LEKAWSKI</b></p> <p><b>Address : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007</b></p>	<p><b>Laboratory : Environmental Division Sydney</b></p> <p><b>Contact : Barbara Hanna</b></p> <p><b>Address : 277-289 Woodpark Road Smithfield NSW Australia 2164</b></p>
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<p><b>E-mail : jonathan.lekawski@erm.com</b></p> <p><b>Telephone : +61 02 8584 8888</b></p> <p><b>Facsimile : +61 02 8584 8800</b></p>	<p><b>E-mail : Barbara.Hanna@alsglobal.com</b></p> <p><b>Telephone : +61 2 8784 8555</b></p> <p><b>Facsimile : +61 2 8784 8555</b></p>
--	--

<p><b>Project : SYMPHONY DELTA WEST</b></p> <p><b>Order number : 0207420/0207423</b></p> <p><b>C-O-C number : ----</b></p> <p><b>Site : ----</b></p> <p><b>Sampler : CF</b></p>	<p><b>Page : 1 of 3</b></p> <p><b>Quote number : ES2013ENVRES0360 (SY/551/13 V4)</b></p> <p><b>QC Level : NEPM 2013 Schedule B(3) and ALS QCS3 requirement</b></p>
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#### Dates

<p><b>Date Samples Received : 20-DEC-2013</b></p> <p><b>Client Requested Due Date : 06-JAN-2014</b></p>	<p><b>Issue Date : 21-DEC-2013 09:58</b></p> <p><b>Scheduled Reporting Date : <b>06-JAN-2014</b></b></p>
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#### Delivery Details

<p><b>Mode of Delivery : Carrier</b></p> <p><b>No. of coolers/boxes : 7 HARD</b></p> <p><b>Security Seal : Intact.</b></p>	<p><b>Temperature : 2.5°C - Ice present</b></p> <p><b>No. of samples received : 5</b></p> <p><b>No. of samples analysed : 4</b></p>
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#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Sample MH\_SS01\_W was received extra and placed on hold.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

### Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) WATER	No analysis requested	WATER - EG020F	Dissolved Metals by ICPMS	WATER - EG051G	Ferrous Iron by Discrete Analyser	WATER - EK040-P	Fluoride(PC)	WATER - EN055 - PG	Ionic Balance by ED037P, ED041G.	WATER - EP066-PCB-WA	Polychlorinated Biphenyls (PCB)	WATER - EP074 (water)	Volatile Organic Compounds	WATER - EP080	BTEXN
ES1327997-001	19-DEC-2013 08:55	MK_MW10		✓			✓	✓	✓	✓	✓	✓	✓	✓				
ES1327997-002	19-DEC-2013 10:23	ML_MW20		✓			✓	✓	✓	✓	✓	✓	✓	✓				
ES1327997-003	19-DEC-2013 15:00	TS4																✓
ES1327997-005	19-DEC-2013 15:00	MH_SS01_W	✓															

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - NT-01	Major Cations (Ca, Mg, Na, K)	WATER - NT-02	Major Anions (Chloride, Sulphate)	WATER - W-02	8 Metals	WATER - W-18	TRH(C6 - C9)/BTEXN	WATER - W-24	TRH/BTEXN/PAH/Phenols
ES1327997-001	19-DEC-2013 08:55	MK_MW10	✓	✓	✓	✓		✓				
ES1327997-002	19-DEC-2013 10:23	ML_MW20	✓	✓	✓			✓				
ES1327997-004	19-DEC-2013 15:00	TB4					✓					

### Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.





## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV ) Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA ) Email jonathan.lekawski@erm.com  
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI ) Email jonathan.lekawski@erm.com  
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC ) Email jonathan.lekawski@erm.com  
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN ) Email jonathan.lekawski@erm.com  
- Chain of Custody (CoC) ( COC ) Email jonathan.lekawski@erm.com  
- EDI Format - ENMRG ( ENMRG ) Email jonathan.lekawski@erm.com  
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM ) Email jonathan.lekawski@erm.com  
- EDI Format - ESDAT ( ESDAT ) Email jonathan.lekawski@erm.com  
- EDI Format - XTab ( XTAB ) Email jonathan.lekawski@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA ) Email symphony.deltawest@erm.com  
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI ) Email symphony.deltawest@erm.com  
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC ) Email symphony.deltawest@erm.com  
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN ) Email symphony.deltawest@erm.com  
- A4 - AU Tax Invoice ( INV ) Email symphony.deltawest@erm.com  
- Chain of Custody (CoC) ( COC ) Email symphony.deltawest@erm.com  
- EDI Format - ENMRG ( ENMRG ) Email symphony.deltawest@erm.com  
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM ) Email symphony.deltawest@erm.com  
- EDI Format - ESDAT ( ESDAT ) Email symphony.deltawest@erm.com

### SYMPHONY ERARING

- \*AU Certificate of Analysis - NATA ( COA ) Email Symphony.Eraring@erm.com  
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI ) Email Symphony.Eraring@erm.com  
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC ) Email Symphony.Eraring@erm.com  
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN ) Email Symphony.Eraring@erm.com  
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- EDI Format - XTab ( XTAB ) Email Symphony.Eraring@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV ) Email au.accounts@erm.com



**CHAIN OF CUSTODY**  
ALS Laboratory  
Phase 104-5

2013-2014 Accredited by NATA  
2013-2014 Accredited by ISO 17025  
2013-2014 Accredited by ISO 9001  
2013-2014 Accredited by ISO 14001  
2013-2014 Accredited by ISO 45001  
2013-2014 Accredited by ISO 27001  
2013-2014 Accredited by ISO 22301  
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2013-2014 Accredited by ISO 26100  
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2013-2014 Accredited by ISO 26299  
2013-2014 Accredited by ISO 26300

CLIENT: BRM

OFFICE: GROUND FLOOR, 33 SAUNDERS ST, PYRMONT NSW 2009

PROJECT: Synthonium - Delta West

ORDER NUMBER: 02074200207423

PROJECT MANAGER: Jonathan Laskowski

SAMPLER: Ford

COO emailed to ALS? (YES / NO)

Email Reports to (will default to PM if no other addresses are listed): Synthonium, Delivered@brm.com

Email Invoiced to (will default to PM if no other addresses are listed): Synthonium, Delivered@brm.com

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

TURNAROUND REQUIREMENTS:

(Standard TAT may be longer for some tests e.g. Ultra Trace Elements)

ALS QUOTE NO.: 9VBE44974

CONTRACT #11 6514 8083

SAMPLER RECEIVED BY: O. [Signature]

RECEIVED BY: [Signature]

DATE/TIME: 19.12.13

DATE/TIME: 20/12/13 8:30

Standard TAT (List site date)

Non Standard or urgent TAT (List site date)

COO REQUIREMENT NUMBER (Circle)

1 2 3 4 0 0 7

RECEIVED BY: [Signature]

DATE/TIME: 20/12/13 8:30

DATE/TIME: [Signature]

DATE/TIME: [Signature]

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (codes below)	(refer to)	TOTAL CONTAINERS	W-4 (TPH/URH) (C6-C36 or 40) (BTEX)	8 Ultra Trace Dissolved Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg) -	Additional Metals Ultra Trace - Se, Ro, F, Mn	Ferrous Iron	PAH/Petrols	VOC Scan	PCB	Cations/Anions	Additional Information
1	MK-MW1D	18.12.13/0855 W				6	✓	✓	✓	✓	✓	✓	✓	✓	TPH-c6-c9, BTEX
2	MK-MW2D	19.12.13/1023 W				6	✓	✓	✓	✓	✓	✓	✓	✓	TPH-c6-c9, BTEX
3	TS4	19.12.13 W				1	✓	✓	✓	✓	✓	✓	✓	✓	TPH-c6-c9, BTEX
4	TR4	19.12.13 W				1	✓	✓	✓	✓	✓	✓	✓	✓	TPH-c6-c9, BTEX
5	MK-SSQ-W	19.12.13													TPH-c6-c9, BTEX

Extra Sample



Environmental Division  
Sydney  
Work Order  
**ES1327997**

Telephone : + 61 -2-8784 8555

Matrix Codes: P = Unpreserved Plastic, N = Nitric Preserved Plastic, CIG = Nitric Preserved CIG, SHT = Sodium Hydroxide Preserved Plastic, B = Sodium Hydroxide Preserved Plastic, A6 = Amber Glass Unpreserved, AP = Airtight Unpreserved, V = VOA via HCl Preserved, VB = VOA via Sodium Bisulfate Preserved, VS = VOA via Sulfamic Acid Preserved, AV = Air Tight Unpreserved via SO<sub>2</sub> = Sulfamic Preserved Amber Glass, H = HCl Preserved Plastic, H8 = HCl Preserved Special on board, S = 3 - Zinc Acetate Preserved Bottle, E = EDTA Preserved Bottle, S1 = Sterile Bottle, ABS = Plastic Bag for Acid Shipped Solids, B = Unpreserved Bag

## CERTIFICATE OF ANALYSIS

Work Order	: <b>ES1328000</b>	Page	: 1 of 9
Client	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: SYMPHONY- DELTA WEST	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 0207420/0207423		
C-O-C number	: ----	Date Samples Received	: 20-DEC-2013
Sampler	: SI	Issue Date	: 06-JAN-2014
Site	: ----		
Quote number	: SY/551/13 V4	No. of samples received	: 4
		No. of samples analysed	: 4

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

## Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Organics
Raymond Commodor	Instrument Chemist	Sydney Inorganics



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MP-GM-5/05	ME-MW01	ME-MW02	ME-MW06	----
				19-DEC-2013 09:40	19-DEC-2013 11:15	19-DEC-2013 12:00	19-DEC-2013 14:50	----
Compound	CAS Number	LOR	Unit	ES1328000-001	ES1328000-002	ES1328000-003	ES1328000-004	----
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	427	356	410	329	----
Total Alkalinity as CaCO3	----	1	mg/L	427	356	410	329	----
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	492	110	55	53	----
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	189	119	58	57	----
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	136	56	43	36	----
Magnesium	7439-95-4	1	mg/L	135	86	77	68	----
Sodium	7440-23-5	1	mg/L	93	52	39	36	----
Potassium	7440-09-7	1	mg/L	12	9	5	5	----
<b>EG035F: Dissolved Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
<b>EG051G: Ferrous Iron by Discrete Analyser</b>								
Ferrous Iron	----	0.05	mg/L	0.74	1.97	17.4	16.7	----
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS</b>								
Selenium	7782-49-2	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	----
Arsenic	7440-38-2	0.2	µg/L	0.6	1.6	5.0	6.4	----
Boron	7440-42-8	5	µg/L	49	18	16	17	----
Cadmium	7440-43-9	0.05	µg/L	0.09	0.13	<0.05	<0.05	----
Chromium	7440-47-3	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	----
Copper	7440-50-8	0.5	µg/L	4.6	<0.5	<0.5	<0.5	----
Lead	7439-92-1	0.1	µg/L	0.1	<0.1	<0.1	<0.1	----
Manganese	7439-96-5	0.5	µg/L	20300	9090	10600	12600	----
Nickel	7440-02-0	0.5	µg/L	115	80.5	132	153	----
Zinc	7440-66-6	1	µg/L	49	18	36	22	----
<b>EK040P: Fluoride by PC Titrator</b>								
Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.1	0.1	----
<b>EN055: Ionic Balance</b>								
Total Anions	----	0.01	meq/L	24.1	12.8	11.0	9.28	----
Total Cations	----	0.01	meq/L	22.2	12.4	10.3	9.09	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MP-GM-5/05	ME-MW01	ME-MW02	ME-MW06	----
				19-DEC-2013 09:40	19-DEC-2013 11:15	19-DEC-2013 12:00	19-DEC-2013 14:50	----
Compound	CAS Number	LOR	Unit	ES1328000-001	ES1328000-002	ES1328000-003	ES1328000-004	----
<b>EN055: Ionic Balance - Continued</b>								
Ionic Balance	----	0.01	%	4.01	1.58	3.15	1.10	----
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	1	µg/L	<1	----	----	----	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	5	µg/L	<5	----	----	----	----
Isopropylbenzene	98-82-8	5	µg/L	<5	----	----	----	----
n-Propylbenzene	103-65-1	5	µg/L	<5	----	----	----	----
1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	----	----	----	----
sec-Butylbenzene	135-98-8	5	µg/L	<5	----	----	----	----
1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	----	----	----	----
tert-Butylbenzene	98-06-6	5	µg/L	<5	----	----	----	----
p-Isopropyltoluene	99-87-6	5	µg/L	<5	----	----	----	----
n-Butylbenzene	104-51-8	5	µg/L	<5	----	----	----	----
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	50	µg/L	<50	----	----	----	----
2-Butanone (MEK)	78-93-3	50	µg/L	<50	----	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	----	----	----	----
2-Hexanone (MBK)	591-78-6	50	µg/L	<50	----	----	----	----
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	5	µg/L	<5	----	----	----	----
<b>EP074D: Fumigants</b>								
2.2-Dichloropropane	594-20-7	5	µg/L	<5	----	----	----	----
1.2-Dichloropropane	78-87-5	5	µg/L	<5	----	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	----	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	----	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	----	----	----	----
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	50	µg/L	<50	----	----	----	----
Chloromethane	74-87-3	50	µg/L	<50	----	----	----	----
Vinyl chloride	75-01-4	50	µg/L	<50	----	----	----	----
Bromomethane	74-83-9	50	µg/L	<50	----	----	----	----
Chloroethane	75-00-3	50	µg/L	<50	----	----	----	----
Trichlorofluoromethane	75-69-4	50	µg/L	<50	----	----	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MP-GM-5/05	ME-MW01	ME-MW02	ME-MW06	----
				19-DEC-2013 09:40	19-DEC-2013 11:15	19-DEC-2013 12:00	19-DEC-2013 14:50	----
Compound	CAS Number	LOR	Unit	ES1328000-001	ES1328000-002	ES1328000-003	ES1328000-004	----
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
1.1-Dichloroethene	75-35-4	5	µg/L	<5	----	----	----	----
Iodomethane	74-88-4	5	µg/L	<5	----	----	----	----
trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	----	----	----	----
1.1-Dichloroethane	75-34-3	5	µg/L	<5	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	----	----	----	----
1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	----	----	----	----
1.1-Dichloropropylene	563-58-6	5	µg/L	<5	----	----	----	----
Carbon Tetrachloride	56-23-5	5	µg/L	<5	----	----	----	----
1.2-Dichloroethane	107-06-2	5	µg/L	<5	----	----	----	----
Trichloroethene	79-01-6	5	µg/L	<5	----	----	----	----
Dibromomethane	74-95-3	5	µg/L	<5	----	----	----	----
1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	----	----	----	----
1.3-Dichloropropane	142-28-9	5	µg/L	<5	----	----	----	----
Tetrachloroethene	127-18-4	5	µg/L	<5	----	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	----	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	----	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	----	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	----	----	----	----
1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	----	----	----	----
Pentachloroethane	76-01-7	5	µg/L	<5	----	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	----	----	----	----
Hexachlorobutadiene	87-68-3	5	µg/L	<5	----	----	----	----
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	5	µg/L	<5	----	----	----	----
Bromobenzene	108-86-1	5	µg/L	<5	----	----	----	----
2-Chlorotoluene	95-49-8	5	µg/L	<5	----	----	----	----
4-Chlorotoluene	106-43-4	5	µg/L	<5	----	----	----	----
1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	----	----	----	----
1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	----	----	----	----
1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	----	----	----	----
1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	----	----	----	----
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	5	µg/L	<5	----	----	----	----





## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MP-GM-5/05	ME-MW01	ME-MW02	ME-MW06	----
				19-DEC-2013 09:40	19-DEC-2013 11:15	19-DEC-2013 12:00	19-DEC-2013 14:50	----
Compound	CAS Number	LOR	Unit	ES1328000-001	ES1328000-002	ES1328000-003	ES1328000-004	----
<b>EP074G: Trihalomethanes - Continued</b>								
Bromodichloromethane	75-27-4	5	µg/L	<5	----	----	----	----
Dibromochloromethane	124-48-1	5	µg/L	<5	----	----	----	----
Bromoform	75-25-2	5	µg/L	<5	----	----	----	----
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	7	µg/L	<7	----	----	----	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	----
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MP-GM-5/05	ME-MW01	ME-MW02	ME-MW06	----
				19-DEC-2013 09:40	19-DEC-2013 11:15	19-DEC-2013 12:00	19-DEC-2013 14:50	----
Compound	CAS Number	LOR	Unit	ES1328000-001	ES1328000-002	ES1328000-003	ES1328000-004	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	----
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	----
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	<100	<100	----
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	----
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	----
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	----
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	----
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	----
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	----
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	----
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	----
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	85.0	----	----	----	----
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	108	----	----	----	----
Toluene-D8	2037-26-5	0.1	%	115	----	----	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				MP-GM-5/05	ME-MW01	ME-MW02	ME-MW06	----
				19-DEC-2013 09:40	19-DEC-2013 11:15	19-DEC-2013 12:00	19-DEC-2013 14:50	----
Compound	CAS Number	LOR	Unit	ES1328000-001	ES1328000-002	ES1328000-003	ES1328000-004	----
<b>EP074S: VOC Surrogates - Continued</b>								
4-Bromofluorobenzene	460-00-4	0.1	%	116	----	----	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	19.3	16.1	21.8	20.7	----
2-Chlorophenol-D4	93951-73-6	0.1	%	44.1	33.0	45.6	48.8	----
2,4,6-Tribromophenol	118-79-6	0.1	%	54.6	39.1	57.2	73.6	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	59.8	50.2	68.8	77.3	----
Anthracene-d10	1719-06-8	0.1	%	74.6	58.6	76.3	87.8	----
4-Terphenyl-d14	1718-51-0	0.1	%	77.6	61.7	81.4	94.6	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	123	108	112	121	----
Toluene-D8	2037-26-5	0.1	%	114	109	123	123	----
4-Bromofluorobenzene	460-00-4	0.1	%	108	103	116	114	----



## Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP066S: PCB Surrogate</b>			
Decachlorobiphenyl	2051-24-3	28.5	129
<b>EP074S: VOC Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	78.3	133.2
Toluene-D8	2037-26-5	79.1	128.9
4-Bromofluorobenzene	460-00-4	80.8	123.7
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	10.0	44
2-Chlorophenol-D4	93951-73-6	14	94
2,4,6-Tribromophenol	118-79-6	17	125
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27.4	113
4-Terphenyl-d14	1718-51-0	32	112
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

## QUALITY CONTROL REPORT

Work Order	: <b>ES1328000</b>	Page	: 1 of 20
Client	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: SYMPHONY- DELTA WEST	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 20-DEC-2013
C-O-C number	: ----	Issue Date	: 06-JAN-2014
Sampler	: SI	No. of samples received	: 4
Order number	: 0207420/0207423	No. of samples analysed	: 4
Quote number	: SY/551/13 V4		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :  
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
RPD = Relative Percentage Difference  
# = Indicates failed QC



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

## Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Organics
Raymond Commodor	Instrument Chemist	Sydney Inorganics



## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>ED037P: Alkalinity by PC Titrator (QC Lot: 3225580)</b>									
ES1327988-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	657	661	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	657	661	0.6	0% - 20%
ES1327989-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	98	99	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	98	99	0.0	0% - 20%
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3227256)</b>									
ES1327989-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	108	107	0.0	0% - 20%
ES1328003-005	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	160	161	0.9	0% - 20%
<b>ED045G: Chloride Discrete analyser (QC Lot: 3227255)</b>									
ES1327989-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	100	97	3.0	0% - 20%
ES1328003-005	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	34	32	8.0	0% - 20%
<b>ED093F: Dissolved Major Cations (QC Lot: 3227254)</b>									
ES1327989-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	21	21	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	25	25	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	78	78	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	8	8	0.0	No Limit
ES1328003-006	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	17	16	0.0	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	13	13	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	33	33	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	6	6	0.0	No Limit
<b>EG035F: Dissolved Mercury by FIMS (QC Lot: 3230538)</b>									
ES1327996-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
<b>EG051G: Ferrous Iron by Discrete Analyser (QC Lot: 3229114)</b>									
ES1327935-006	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	13.3	13.5	1.5	0% - 20%
ES1327989-002	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	11.8	11.8	0.09	0% - 20%
<b>EG051G: Ferrous Iron by Discrete Analyser (QC Lot: 3229115)</b>									
ES1328000-004	ME-MW06	EG051G: Ferrous Iron	----	0.05	mg/L	16.7	16.7	0.06	0% - 20%
ES1328002-003	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	3.04	3.03	0.4	0% - 20%
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 3228353)</b>									
ES1327851-001	Anonymous	EG094A-F: Cadmium	7440-43-9	0.05	µg/L	0.10	0.10	0.0	No Limit
		EG094A-F: Lead	7439-92-1	0.1	µg/L	1.0	0.9	0.0	No Limit
		EG094A-F: Arsenic	7440-38-2	0.2	µg/L	0.2	<0.2	0.0	No Limit





Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 3228353) - continued</b>									
ES1327851-001	Anonymous	EG094A-F: Chromium	7440-47-3	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG094A-F: Copper	7440-50-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG094A-F: Manganese	7439-96-5	0.5	µg/L	1750	1700	2.7	0% - 20%
		EG094A-F: Nickel	7440-02-0	0.5	µg/L	126	123	2.5	0% - 20%
		EG094A-F: Zinc	7440-66-6	1	µg/L	434	425	2.2	0% - 20%
		EG094A-F: Boron	7440-42-8	5	µg/L	45	44	0.0	No Limit
ES1328000-002	ME-MW01	EG094A-F: Cadmium	7440-43-9	0.05	µg/L	0.13	0.12	0.0	No Limit
		EG094A-F: Lead	7439-92-1	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG094A-F: Arsenic	7440-38-2	0.2	µg/L	1.6	1.7	0.0	No Limit
		EG094A-F: Chromium	7440-47-3	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG094A-F: Copper	7440-50-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG094A-F: Manganese	7439-96-5	0.5	µg/L	9090	8990	1.1	0% - 20%
		EG094A-F: Nickel	7440-02-0	0.5	µg/L	80.5	81.0	0.6	0% - 20%
		EG094A-F: Zinc	7440-66-6	1	µg/L	18	18	0.0	0% - 50%
EG094A-F: Boron	7440-42-8	5	µg/L	18	18	0.0	No Limit		
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 3228354)</b>									
ES1327851-001	Anonymous	EG094B-F: Selenium	7782-49-2	0.2	µg/L	0.3	<0.2	50.2	No Limit
ES1328000-002	ME-MW01	EG094B-F: Selenium	7782-49-2	0.2	µg/L	<0.2	<0.2	0.0	No Limit
<b>EK040P: Fluoride by PC Titrator (QC Lot: 3225581)</b>									
ES1327989-002	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
ES1328000-002	ME-MW01	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.0	No Limit
<b>EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 3227667)</b>									
ES1328000-001	MP-GM-5/05	EP066: Total Polychlorinated biphenyls	----	1	µg/L	<1	<1	0.0	No Limit
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3229797)</b>									
ES1327989-001	Anonymous	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
ES1328001-001	Anonymous	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3229797) - continued</b>									
ES1328001-001	Anonymous	EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
<b>EP074B: Oxygenated Compounds (QC Lot: 3229797)</b>									
ES1327989-001	Anonymous	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
ES1328001-001	Anonymous	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
<b>EP074C: Sulfonated Compounds (QC Lot: 3229797)</b>									
ES1327989-001	Anonymous	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
ES1328001-001	Anonymous	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
<b>EP074D: Fumigants (QC Lot: 3229797)</b>									
ES1327989-001	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
ES1328001-001	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3229797)</b>									
ES1327989-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3229797) - continued</b>									
ES1327989-001	Anonymous	EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit
ES1328001-001	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3229797) - continued</b>									
ES1328001-001	Anonymous	EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3229797)</b>									
ES1327989-001	Anonymous	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
ES1328001-001	Anonymous	EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
ES1328001-001	Anonymous	EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
ES1328001-001	Anonymous	EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit
		EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit
<b>EP074H: Naphthalene (QC Lot: 3229797)</b>									
ES1327989-001	Anonymous	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit
ES1328001-001	Anonymous	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3227669)</b>									
ES1328000-001	MP-GM-5/05	EP075(SIM): Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3227669) - continued</b>									
ES1328000-001	MP-GM-5/05	EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	0.0	No Limit
ES1328000-004	ME-MW06	EP075(SIM): Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	0.0	No Limit
		<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3227669)</b>							
ES1328000-001	MP-GM-5/05	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		ES1328000-004	ME-MW06	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5
EP075(SIM): Naphthalene	91-20-3			1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): Acenaphthylene	208-96-8			1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): Acenaphthene	83-32-9			1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): Fluorene	86-73-7			1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): Phenanthrene	85-01-8			1.0	µg/L	<1.0	<1.0	0.0	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3227669) - continued</b>									
ES1328000-004	ME-MW06	EP075(SIM): Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3227668)</b>									
ES1328000-001	MP-GM-5/05	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
ES1328000-004	ME-MW06	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3229798)</b>									
ES1327989-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1328001-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3229802)</b>									
ES1327901-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1328000-002	ME-MW01	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3227668)</b>									
ES1328000-001	MP-GM-5/05	EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
ES1328000-004	ME-MW06	EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3229798)</b>									
ES1327989-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES1328001-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3229802)</b>									
ES1327901-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES1328000-002	ME-MW01	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3229798)</b>									
ES1327989-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP080: BTEXN (QC Lot: 3229798) - continued</b>									
ES1327989-001	Anonymous	EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES1328001-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3229802)</b>									
ES1327901-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES1328000-002	ME-MW01	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit





### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>ED037P: Alkalinity by PC Titrator (QCLot: 3225580)</b>									
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	----	200 mg/L	97.3	81	111	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3227256)</b>									
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	102	86	122	
<b>ED045G: Chloride Discrete analyser (QCLot: 3227255)</b>									
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	97.6	77	123	
<b>ED093F: Dissolved Major Cations (QCLot: 3227254)</b>									
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	87	113	
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	89	113	
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	101	79	113	
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	102	87	115	
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3230538)</b>									
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	94.0	78	114	
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3229114)</b>									
EG051G: Ferrous Iron	----	0.10	mg/L	<0.10	2.00 mg/L	101	89	113	
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3229115)</b>									
EG051G: Ferrous Iron	----	0.10	mg/L	<0.10	2.00 mg/L	109	89	113	
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3228353)</b>									
EG094A-F: Arsenic	7440-38-2	0.2	µg/L	<0.2	10 µg/L	92.3	75	129	
EG094A-F: Boron	7440-42-8	5	µg/L	<5	10 µg/L	121	79	129	
EG094A-F: Cadmium	7440-43-9	0.05	µg/L	<0.05	10 µg/L	99.6	78	112	
EG094A-F: Chromium	7440-47-3	0.2	µg/L	<0.2	10 µg/L	98.1	71	123	
EG094A-F: Copper	7440-50-8	0.5	µg/L	<0.5	10 µg/L	101	77	125	
EG094A-F: Lead	7439-92-1	0.1	µg/L	<0.1	10 µg/L	89.2	74	118	
EG094A-F: Manganese	7439-96-5	0.5	µg/L	<0.5	10 µg/L	95.1	79	119	
EG094A-F: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	109	72	128	
EG094A-F: Zinc	7440-66-6	1	µg/L	<1	10 µg/L	109	76	134	
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3228354)</b>									
EG094B-F: Selenium	7782-49-2	0.2	µg/L	<0.2	10 µg/L	106	75	125	
<b>EK040P: Fluoride by PC Titrator (QCLot: 3225581)</b>									
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5.0 mg/L	94.8	75	119	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3227667)</b>									
EP066: Total Polychlorinated biphenyls	----	1	µg/L	<1	10 µg/L	103	61.6	107	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3229797)</b>									



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3229797) - continued</b>									
EP074: Styrene	100-42-5	5	µg/L	<5	10 µg/L	104	74	118	
EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	10 µg/L	108	75	121	
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	10 µg/L	111	67	123	
EP074: 1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	10 µg/L	107	70	122	
EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	10 µg/L	111	69	123	
EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	10 µg/L	109	71	121	
EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	10 µg/L	110	70	122	
EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	10 µg/L	109	67	123	
EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	10 µg/L	110	62	126	
<b>EP074B: Oxygenated Compounds (QCLot: 3229797)</b>									
EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	100 µg/L	104	61.4	134	
EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	100 µg/L	105	73.6	130	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	100 µg/L	104	61	139	
EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	100 µg/L	104	65	137	
<b>EP074C: Sulfonated Compounds (QCLot: 3229797)</b>									
EP074: Carbon disulfide	75-15-0	5	µg/L	<5	10 µg/L	97.2	72.8	127	
<b>EP074D: Fumigants (QCLot: 3229797)</b>									
EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	10 µg/L	103	61	119	
EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	10 µg/L	110	76	120	
EP074: cis-1,3-Dichloropropylene	10061-01-5	10	µg/L	<10	10 µg/L	91.7	62	120	
EP074: trans-1,3-Dichloropropylene	10061-02-6	10	µg/L	<10	10 µg/L	94.7	61	119	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	10 µg/L	105	69	117	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3229797)</b>									
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	100 µg/L	114	60.6	138	
EP074: Chloromethane	74-87-3	50	µg/L	<50	100 µg/L	118	67.4	130	
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	100 µg/L	# 130	69.4	129	
EP074: Bromomethane	74-83-9	50	µg/L	<50	100 µg/L	116	56	140	
EP074: Chloroethane	75-00-3	50	µg/L	<50	100 µg/L	123	63	135	
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	100 µg/L	119	65	131	
EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	10 µg/L	104	69	123	
EP074: Iodomethane	74-88-4	5	µg/L	<5	10 µg/L	102	70.2	128	
EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	10 µg/L	109	71	119	
EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	10 µg/L	112	75	119	
EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	10 µg/L	111	77	117	
EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	10 µg/L	103	61	119	
EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	10 µg/L	109	73	119	
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	10 µg/L	98.5	63	121	
EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	10 µg/L	118	78	122	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3229797) - continued</b>									
EP074: Trichloroethene	79-01-6	5	µg/L	<5	10 µg/L	107	74	120	
EP074: Dibromomethane	74-95-3	5	µg/L	<5	10 µg/L	105	74	118	
EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	10 µg/L	110	75	123	
EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	10 µg/L	107	79	121	
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	10 µg/L	108	72	124	
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	10 µg/L	95.5	66	114	
EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	10 µg/L	101	60	120	
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	10 µg/L	95.2	70.6	128	
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	10 µg/L	103	70	124	
EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	10 µg/L	113	74	128	
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	10 µg/L	87.4	71.8	126	
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	10 µg/L	86.1	66.4	136	
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	10 µg/L	117	58	132	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3229797)</b>									
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	10 µg/L	116	80	118	
EP074: Bromobenzene	108-86-1	5	µg/L	<5	10 µg/L	105	76	116	
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	10 µg/L	115	71	121	
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	10 µg/L	111	71	121	
EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	10 µg/L	112	74	120	
EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	10 µg/L	115	72	120	
EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	10 µg/L	110	77	117	
EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	10 µg/L	112	60	126	
EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	10 µg/L	118	67	125	
<b>EP074G: Trihalomethanes (QCLot: 3229797)</b>									
EP074: Chloroform	67-66-3	5	µg/L	<5	10 µg/L	113	76	118	
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	10 µg/L	100	64	118	
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	10 µg/L	95.3	65	115	
EP074: Bromoform	75-25-2	5	µg/L	<5	10 µg/L	90.9	73.5	126	
<b>EP074H: Naphthalene (QCLot: 3229797)</b>									
EP074: Naphthalene	91-20-3	7	µg/L	<7	10 µg/L	92.6	61	125	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3227669)</b>									
EP075(SIM): Phenol	108-95-2	0.2	µg/L	----	5 µg/L	36.6	24.5	61.9	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Chlorophenol	95-57-8	0.2	µg/L	----	5 µg/L	64.6	63.8	110	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Methylphenol	95-48-7	0.2	µg/L	----	5 µg/L	66.4	55.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	0.4	µg/L	----	10 µg/L	60.3	42.5	114	
		2	µg/L	<2.0	----	----	----	----	



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3227669) - continued</b>									
EP075(SIM): 2-Nitrophenol	88-75-5	0.2	µg/L	----	5 µg/L	71.9	62.7	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.2	µg/L	----	5 µg/L	66.4	59.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.2	µg/L	----	5 µg/L	85.5	59.3	122	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.2	µg/L	----	5 µg/L	76.0	64.3	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.2	µg/L	----	5 µg/L	67.8	63	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.2	µg/L	----	5 µg/L	81.4	58.7	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.2	µg/L	----	5 µg/L	81.8	50	108	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Pentachlorophenol	87-86-5	0.4	µg/L	----	10 µg/L	# 99.8	8.7	95	
		2	µg/L	<2.0	----	----	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3227669)</b>									
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	5 µg/L	70.8	58.6	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	5 µg/L	77.1	63.6	114	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	5 µg/L	73.5	62.2	113	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	5 µg/L	78.4	63.9	115	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	5 µg/L	94.8	62.6	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	5 µg/L	94.7	64.3	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	5 µg/L	106	63.6	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	5 µg/L	103	63.1	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	5 µg/L	98.6	64.1	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	5 µg/L	103	62.5	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	5 µg/L	95.1	61.7	119	
		1	µg/L	<1.0	----	----	----	----	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike	Spike Recovery (%)	Recovery Limits (%)	
					Concentration	LCS	Low	High
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3227669) - continued</b>								
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	5 µg/L	104	61.7	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	5 µg/L	89.0	63.3	117
		0.5	µg/L	<0.5	----	----	----	----
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	5 µg/L	87.9	59.9	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	----	5 µg/L	84.5	61.2	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	----	5 µg/L	95.5	59.1	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	1	µg/L	<1.0	----	----	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3227668)</b>								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	86.6	59	129
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	106	71	131
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	83.8	62	120
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229798)</b>								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	126	75	127
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229802)</b>								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	103	75	127
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3227668)</b>								
EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	2500 µg/L	97.8	58.9	131
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	104	73.9	138
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
		50	µg/L	----	1500 µg/L	86.2	67	127
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229798)</b>								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	127	75	127
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229802)</b>								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	104	75	127
<b>EP080: BTEXN (QCLot: 3229798)</b>								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	123	70	124
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	118	65	129
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	112	70	120
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	111	69	121
	106-42-3							
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	112	72	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	109	70	124
<b>EP080: BTEXN (QCLot: 3229802)</b>								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	112	70	124



Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit		Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High
<b>EP080: BTEXN (QCLot: 3229802) - continued</b>								
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	102	65	129
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	99.2	70	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	101	69	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	104	72	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	108	70	124

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: WATER				Matrix Spike (MS) Report			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%) Low High	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3227256)</b>							
ES1327989-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130
<b>ED045G: Chloride Discrete analyser (QCLot: 3227255)</b>							
ES1327989-002	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	94.4	70	130
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3230538)</b>							
ES1327996-002	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	82.6	70	130
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3229114)</b>							
ES1327935-006	Anonymous	EG051G: Ferrous Iron	----	10 mg/L	92.0	68	128
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3229115)</b>							
ES1328000-004	ME-MW06	EG051G: Ferrous Iron	----	1.00 mg/L	# Not Determined	68	128
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3228353)</b>							
ES1328000-001	MP-GM-5/05	EG094A-F: Arsenic	7440-38-2	50 µg/L	124	70	130
		EG094A-F: Cadmium	7440-43-9	12.5 µg/L	105	70	130
		EG094A-F: Chromium	7440-47-3	50 µg/L	107	70	130
		EG094A-F: Copper	7440-50-8	50 µg/L	103	70	130
		EG094A-F: Lead	7439-92-1	50 µg/L	94.2	70	130
		EG094A-F: Manganese	7439-96-5	50 µg/L	# Not Determined	70	130
		EG094A-F: Nickel	7440-02-0	50 µg/L	112	70	130
EG094A-F: Zinc	7440-66-6	50 µg/L	113	70	130		
<b>EK040P: Fluoride by PC Titrator (QCLot: 3225581)</b>							



Sub-Matrix: WATER

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EK040P: Fluoride by PC Titrator (QCLot: 3225581) - continued</b>							
ES1327989-002	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	103	70	130
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3227667)</b>							
ES1328000-001	MP-GM-5/05	EP066: Total Polychlorinated biphenyls	----	10 µg/L	84.0	70	130
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3229797)</b>							
ES1327989-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	25 µg/L	110	70	130
		EP074: Trichloroethene	79-01-6	25 µg/L	120	70	130
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3229797)</b>							
ES1327989-001	Anonymous	EP074: Chlorobenzene	108-90-7	25 µg/L	125	70	130
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3227669)</b>							
ES1328000-001	MP-GM-5/05	EP075(SIM): Phenol	108-95-2	20 µg/L	40.8	20	130
		EP075(SIM): 2-Chlorophenol	95-57-8	20 µg/L	85.0	60	130
		EP075(SIM): 2-Nitrophenol	88-75-5	20 µg/L	83.2	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	20 µg/L	83.5	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	20 µg/L	69.5	20	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3227669)</b>							
ES1328000-001	MP-GM-5/05	EP075(SIM): Acenaphthene	83-32-9	20 µg/L	78.3	70	130
		EP075(SIM): Pyrene	129-00-0	20 µg/L	89.4	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3227668)</b>							
ES1328000-001	MP-GM-5/05	EP071: C10 - C14 Fraction	----	200 µg/L	115	74	150
		EP071: C15 - C28 Fraction	----	300 µg/L	108	77	153
		EP071: C29 - C36 Fraction	----	200 µg/L	111	67	153
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229798)</b>							
ES1327989-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	112	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229802)</b>							
ES1327901-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	106	70	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3227668)</b>							
ES1328000-001	MP-GM-5/05	EP071: >C10 - C16 Fraction	>C10_C16	250 µg/L	98.8	74	150
		EP071: >C16 - C34 Fraction	----	350 µg/L	104	77	153
		EP071: >C34 - C40 Fraction	----	150 µg/L	111	67	153
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229798)</b>							
ES1327989-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	113	70	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229802)</b>							
ES1327901-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	108	70	130
<b>EP080: BTEXN (QCLot: 3229798)</b>							
ES1327989-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	109	70	130





Sub-Matrix: WATER

				Matrix Spike (MS) Report				
				Spike	SpikeRecovery(%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EP080: BTEXN (QCLot: 3229798) - continued</b>								
ES1327989-001	Anonymous	EP080: Toluene	108-88-3	25 µg/L	110	70	130	
		EP080: Ethylbenzene	100-41-4	25 µg/L	116	70	130	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	106	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	25 µg/L	114	70	130	
		EP080: Naphthalene	91-20-3	25 µg/L	113	70	130	
<b>EP080: BTEXN (QCLot: 3229802)</b>								
ES1327901-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	107	70	130	
		EP080: Toluene	108-88-3	25 µg/L	104	70	130	
		EP080: Ethylbenzene	100-41-4	25 µg/L	104	70	130	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	102	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	25 µg/L	105	70	130	
		EP080: Naphthalene	91-20-3	25 µg/L	101	70	130	

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: WATER

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
					Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit	
<b>EK040P: Fluoride by PC Titrator (QCLot: 3225581)</b>											
ES1327989-002	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	103	----	70	130	----	----	
<b>ED045G: Chloride Discrete analyser (QCLot: 3227255)</b>											
ES1327989-002	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	94.4	----	70	130	----	----	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3227256)</b>											
ES1327989-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	----	70	130	----	----	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3227667)</b>											
ES1328000-001	MP-GM-5/05	EP066: Total Polychlorinated biphenyls	----	10 µg/L	84.0	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3227668)</b>											
ES1328000-001	MP-GM-5/05	EP071: C10 - C14 Fraction	----	200 µg/L	115	----	74	150	----	----	
		EP071: C15 - C28 Fraction	----	300 µg/L	108	----	77	153	----	----	
		EP071: C29 - C36 Fraction	----	200 µg/L	111	----	67	153	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3227668)</b>											
ES1328000-001	MP-GM-5/05	EP071: >C10 - C16 Fraction	>C10_C16	250 µg/L	98.8	----	74	150	----	----	
		EP071: >C16 - C34 Fraction	----	350 µg/L	104	----	77	153	----	----	



Sub-Matrix: **WATER**

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3227668) - continued</b>										
ES1328000-001	MP-GM-5/05	EP071: >C34 - C40 Fraction	----	150 µg/L	111	----	67	153	----	----
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3227669)</b>										
ES1328000-001	MP-GM-5/05	EP075(SIM): Phenol	108-95-2	20 µg/L	40.8	----	20	130	----	----
		EP075(SIM): 2-Chlorophenol	95-57-8	20 µg/L	85.0	----	60	130	----	----
		EP075(SIM): 2-Nitrophenol	88-75-5	20 µg/L	83.2	----	60	130	----	----
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	20 µg/L	83.5	----	70	130	----	----
		EP075(SIM): Pentachlorophenol	87-86-5	20 µg/L	69.5	----	20	130	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3227669)</b>										
ES1328000-001	MP-GM-5/05	EP075(SIM): Acenaphthene	83-32-9	20 µg/L	78.3	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	20 µg/L	89.4	----	70	130	----	----
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3228353)</b>										
ES1328000-001	MP-GM-5/05	EG094A-F: Arsenic	7440-38-2	50 µg/L	124	----	70	130	----	----
		EG094A-F: Cadmium	7440-43-9	12.5 µg/L	105	----	70	130	----	----
		EG094A-F: Chromium	7440-47-3	50 µg/L	107	----	70	130	----	----
		EG094A-F: Copper	7440-50-8	50 µg/L	103	----	70	130	----	----
		EG094A-F: Lead	7439-92-1	50 µg/L	94.2	----	70	130	----	----
		EG094A-F: Manganese	7439-96-5	50 µg/L	# Not Determined	----	70	130	----	----
		EG094A-F: Nickel	7440-02-0	50 µg/L	112	----	70	130	----	----
		EG094A-F: Zinc	7440-66-6	50 µg/L	113	----	70	130	----	----
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3229114)</b>										
ES1327935-006	Anonymous	EG051G: Ferrous Iron	----	10 mg/L	92.0	----	68	128	----	----
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3229115)</b>										
ES1328000-004	ME-MW06	EG051G: Ferrous Iron	----	1.00 mg/L	# Not Determined	----	68	128	----	----
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3229797)</b>										
ES1327989-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	25 µg/L	110	----	70	130	----	----
		EP074: Trichloroethene	79-01-6	25 µg/L	120	----	70	130	----	----
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3229797)</b>										
ES1327989-001	Anonymous	EP074: Chlorobenzene	108-90-7	25 µg/L	125	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229798)</b>										
ES1327989-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	112	----	70	130	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229798)</b>										
ES1327989-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	113	----	70	130	----	----
<b>EP080: BTEXN (QCLot: 3229798)</b>										
ES1327989-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	109	----	70	130	----	----
		EP080: Toluene	108-88-3	25 µg/L	110	----	70	130	----	----



Sub-Matrix: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>EP080: BTEXN (QCLot: 3229798) - continued</b>										
ES1327989-001	Anonymous	EP080: Ethylbenzene	100-41-4	25 µg/L	116	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	106	----	70	130	----	----
		EP080: ortho-Xylene	95-47-6	25 µg/L	114	----	70	130	----	----
		EP080: Naphthalene	91-20-3	25 µg/L	113	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229802)</b>										
ES1327901-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	106	----	70	130	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229802)</b>										
ES1327901-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	108	----	70	130	----	----
<b>EP080: BTEXN (QCLot: 3229802)</b>										
ES1327901-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	107	----	70	130	----	----
		EP080: Toluene	108-88-3	25 µg/L	104	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	25 µg/L	104	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	102	----	70	130	----	----
		EP080: ortho-Xylene	95-47-6	25 µg/L	105	----	70	130	----	----
		EP080: Naphthalene	91-20-3	25 µg/L	101	----	70	130	----	----
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3230538)</b>										
ES1327996-002	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	82.6	----	70	130	----	----

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1328000</b>	Page	: 1 of 9
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: SYMPHONY- DELTA WEST	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 20-DEC-2013
C-O-C number	: ----	Issue Date	: 06-JAN-2014
Sampler	: SI	No. of samples received	: 4
Order number	: 0207420/0207423	No. of samples analysed	: 4
Quote number	: SY/551/13 V4		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER** Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>ED037P: Alkalinity by PC Titrator</b>							
<b>Clear Plastic Bottle - Natural (ED037-P)</b> MP-GM-5/05, ME-MW02, ME-MW02, ME-MW06	19-DEC-2013	---	02-JAN-2014	----	21-DEC-2013	02-JAN-2014	✓
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>							
<b>Clear Plastic Bottle - Natural (ED041G)</b> MP-GM-5/05, ME-MW02, ME-MW02, ME-MW06	19-DEC-2013	---	16-JAN-2014	----	23-DEC-2013	16-JAN-2014	✓
<b>ED045G: Chloride Discrete analyser</b>							
<b>Clear Plastic Bottle - Natural (ED045G)</b> MP-GM-5/05, ME-MW02, ME-MW02, ME-MW06	19-DEC-2013	---	16-JAN-2014	----	23-DEC-2013	16-JAN-2014	✓
<b>ED093F: Dissolved Major Cations</b>							
<b>Clear Plastic Bottle - Natural (ED093F)</b> MP-GM-5/05, ME-MW02, ME-MW02, ME-MW06	19-DEC-2013	---	26-DEC-2013	----	23-DEC-2013	26-DEC-2013	✓
<b>EG035F: Dissolved Mercury by FIMS</b>							
<b>Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG035F)</b> ME-MW01	19-DEC-2013	---	16-JAN-2014	----	27-DEC-2013	16-JAN-2014	✓
<b>Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)</b> MP-GM-5/05, ME-MW02, ME-MW02, ME-MW06	19-DEC-2013	---	16-JAN-2014	----	27-DEC-2013	16-JAN-2014	✓
<b>EG051G: Ferrous Iron by Discrete Analyser</b>							
<b>Clear Plastic Bottle - HCl - Filtered (EG051G)</b> MP-GM-5/05, ME-MW02, ME-MW02, ME-MW06	19-DEC-2013	----	----	----	24-DEC-2013	26-DEC-2013	✓
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS</b>							
<b>Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094A-F)</b> MP-GM-5/05, ME-MW02, ME-MW02, ME-MW06	19-DEC-2013	---	17-JUN-2014	----	24-DEC-2013	17-JUN-2014	✓



Matrix: **WATER** Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS</b>							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094B-F) MP-GM-5/05, ME-MW02, ME-MW01, ME-MW06	19-DEC-2013	---	17-JUN-2014	----	24-DEC-2013	17-JUN-2014	✓
<b>EK040P: Fluoride by PC Titrator</b>							
Clear Plastic Bottle - Natural (EK040P) MP-GM-5/05, ME-MW02, ME-MW01, ME-MW06	19-DEC-2013	---	16-JAN-2014	----	21-DEC-2013	16-JAN-2014	✓
<b>EP066: Polychlorinated Biphenyls (PCB)</b>							
Amber Glass Bottle - Unpreserved (EP066) MP-GM-5/05	19-DEC-2013	23-DEC-2013	26-DEC-2013	✓	02-JAN-2014	11-FEB-2014	✓
<b>EP080/071: Total Petroleum Hydrocarbons</b>							
Amber Glass Bottle - Unpreserved (EP071) MP-GM-5/05, ME-MW02, ME-MW01, ME-MW06	19-DEC-2013	23-DEC-2013	26-DEC-2013	✓	02-JAN-2014	11-FEB-2014	✓
<b>EP074D: Fumigants</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MP-GM-5/05	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>EP074E: Halogenated Aliphatic Compounds</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MP-GM-5/05	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>EP074F: Halogenated Aromatic Compounds</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MP-GM-5/05	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MP-GM-5/05	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>EP074H: Naphthalene</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MP-GM-5/05	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>EP074B: Oxygenated Compounds</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MP-GM-5/05	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>EP074C: Sulfonated Compounds</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MP-GM-5/05	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>EP074G: Trihalomethanes</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MP-GM-5/05	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP075(SIM)A: Phenolic Compounds</b>							
<b>Amber Glass Bottle - Unpreserved (EP075(SIM))</b> MP-GM-5/05, ME-MW02, ME-MW01, ME-MW06	19-DEC-2013	23-DEC-2013	26-DEC-2013	✓	02-JAN-2014	11-FEB-2014	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>							
<b>Amber Glass Bottle - Unpreserved (EP075(SIM))</b> MP-GM-5/05, ME-MW02, ME-MW01, ME-MW06	19-DEC-2013	23-DEC-2013	26-DEC-2013	✓	02-JAN-2014	11-FEB-2014	✓
<b>EP080: BTEXN</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MP-GM-5/05	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> ME-MW01, ME-MW06 ME-MW02,	19-DEC-2013	31-DEC-2013	02-JAN-2014	✓	31-DEC-2013	02-JAN-2014	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MP-GM-5/05	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> ME-MW01, ME-MW06 ME-MW02,	19-DEC-2013	31-DEC-2013	02-JAN-2014	✓	31-DEC-2013	02-JAN-2014	✓





## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Alkalinity by PC Titrator	ED037-P	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	9	11.1	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	4	40	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	2	12	16.7	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	8	12.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	15	13.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	4	40	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
Alkalinity by PC Titrator	ED037-P	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	9	11.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	15	6.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
Chloride by Discrete Analyser	ED045G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	9	11.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



Matrix: **WATER** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Method Blanks (MB) - Continued</b>							
Major Cations - Dissolved	ED093F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	15	6.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
Chloride by Discrete Analyser	ED045G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	9	11.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	15	6.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Sulfate (Turbidimetric) as SO <sub>4</sub> <sup>2-</sup> by Discrete Analyser	ED041G	WATER	APHA 21st ed., 4500-SO <sub>4</sub> Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> <sup>2-</sup> concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Chloride by Discrete Analyser	ED045G	WATER	APHA 21st ed., 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	Major Cations is determined based on APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um filtered sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Hardness parameters are calculated based on APHA 21st ed., 2340 B. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Dissolved Mercury by FIMS	EG035F	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) Samples are 0.45 um filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Ferrous Iron by Discrete Analyser	EG051G	WATER	APHA 21st ed., 3500 Fe-B. A colorimetric determination based on the reaction between phenanthroline and ferrous iron at pH 3.2-3.3 to form an orange-red complex that is measured against a five-point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)



Analytical Methods	Method	Matrix	Method Descriptions
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Fluoride by PC Titrator	EK040P	WATER	APHA 21st ed., 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by Turbi SO4 by DA. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Polychlorinated Biphenyls (PCB)	EP066	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
TPH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Volatile Organic Compounds	EP074	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
TPH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
Lab Acidification of Dissolved Metals	EN80F	WATER	US EPA Method 200.8
Separatory Funnel Extraction of Liquids	ORG14	WATER	USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.



## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Laboratory Control Spike (LCS) Recoveries</b>							
EP074E: Halogenated Aliphatic Compounds	3855103-002	----	Vinyl chloride	75-01-4	130 %	69.4-129%	Recovery greater than upper control limit
EP075(SIM)A: Phenolic Compounds	3852928-011	----	Pentachlorophenol	87-86-5	99.8 %	8.7-95%	Recovery greater than upper control limit
<b>Matrix Spike (MS) Recoveries</b>							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	ES1327989-002	Anonymous	Sulfate as SO4 - Turbidimetric	14808-79-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG051G: Ferrous Iron by Discrete Analyser	ES1328000-004	ME-MW06	Ferrous Iron	----	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG094F: Dissolved Metals in Fresh Water by ORC-ICP	ES1328000-001	MP-GM-5/05	Manganese	7439-96-5	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.

#### Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- No Analysis Holding Time Outliers exist.

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

**Work Order : ES1328000**

<p><b>Client :</b> ENVIRO RESOURCES MANAGEMENT</p> <p><b>Contact :</b> MR JONATHAN LEKAWSKI</p> <p><b>Address :</b> GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007</p>	<p><b>Laboratory :</b> Environmental Division Sydney</p> <p><b>Contact :</b> Barbara Hanna</p> <p><b>Address :</b> 277-289 Woodpark Road Smithfield NSW Australia 2164</p>
--	--

<p><b>E-mail :</b> jonathan.lekawski@erm.com</p> <p><b>Telephone :</b> +61 02 8584 8888</p> <p><b>Facsimile :</b> +61 02 8584 8800</p>	<p><b>E-mail :</b> Barbara.Hanna@alsglobal.com</p> <p><b>Telephone :</b> +61 2 8784 8555</p> <p><b>Facsimile :</b> +61 2 8784 8555</p>
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<p><b>Project :</b> SYMPHONY- DELTA WEST</p> <p><b>Order number :</b> 0207420/0207423</p> <p><b>C-O-C number :</b> ----</p> <p><b>Site :</b> ----</p> <p><b>Sampler :</b> SI</p>	<p><b>Page :</b> 1 of 3</p> <p><b>Quote number :</b> ES2013ENVRES0360 (SY/551/13 V4)</p> <p><b>QC Level :</b> NEPM 2013 Schedule B(3) and ALS QCS3 requirement</p>
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#### Dates

<p><b>Date Samples Received :</b> 20-DEC-2013</p> <p><b>Client Requested Due Date :</b> 06-JAN-2014</p>	<p><b>Issue Date :</b> 21-DEC-2013 13:18</p> <p><b>Scheduled Reporting Date :</b> <b>06-JAN-2014</b></p>
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#### Delivery Details

<p><b>Mode of Delivery :</b> Carrier</p> <p><b>No. of coolers/boxes :</b> 7 HARD</p> <p><b>Security Seal :</b> Intact.</p>	<p><b>Temperature :</b> 2.5°C - Ice present</p> <p><b>No. of samples received :</b> 4</p> <p><b>No. of samples analysed :</b> 4</p>
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#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EG035F Dissolved Mercury by FIMS	WATER - EG051G Ferrous Iron by Discrete Analyser	WATER - EG094A-F Dissolved Metals in Fresh Water Suite A by	WATER - EG094B-F Dissolved Metals in fresh water Suite B by	WATER - EK040-P Fluoride(PC)	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP066-PCB-WA Polychlorinated Biphenyls (PCB)	WATER - EP074 (water) Volatile Organic Compounds
ES1328000-001	19-DEC-2013 09:40	MP-GM-5/05	✓	✓	✓	✓	✓	✓	✓	✓
ES1328000-002	19-DEC-2013 11:15	ME-MW01	✓	✓	✓	✓	✓	✓		
ES1328000-003	19-DEC-2013 12:00	ME-MW02	✓	✓	✓	✓	✓	✓		
ES1328000-004	19-DEC-2013 14:50	ME-MW06	✓	✓	✓	✓	✓	✓		

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)	WATER - W-24 TPH/BTEX/PAH/Phenols
ES1328000-001	19-DEC-2013 09:40	MP-GM-5/05	✓	✓	✓
ES1328000-002	19-DEC-2013 11:15	ME-MW01	✓	✓	✓
ES1328000-003	19-DEC-2013 12:00	ME-MW02	✓	✓	✓
ES1328000-004	19-DEC-2013 14:50	ME-MW06	✓	✓	✓

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.





## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV ) Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA ) Email jonathan.lekawski@erm.com  
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI ) Email jonathan.lekawski@erm.com  
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC ) Email jonathan.lekawski@erm.com  
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN ) Email jonathan.lekawski@erm.com  
- Chain of Custody (CoC) ( COC ) Email jonathan.lekawski@erm.com  
- EDI Format - ENMRG ( ENMRG ) Email jonathan.lekawski@erm.com  
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM ) Email jonathan.lekawski@erm.com  
- EDI Format - ESDAT ( ESDAT ) Email jonathan.lekawski@erm.com  
- EDI Format - XTab ( XTAB ) Email jonathan.lekawski@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA ) Email symphony.deltawest@erm.com  
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI ) Email symphony.deltawest@erm.com  
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC ) Email symphony.deltawest@erm.com  
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN ) Email symphony.deltawest@erm.com  
- A4 - AU Tax Invoice ( INV ) Email symphony.deltawest@erm.com  
- Chain of Custody (CoC) ( COC ) Email symphony.deltawest@erm.com  
- EDI Format - ENMRG ( ENMRG ) Email symphony.deltawest@erm.com  
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM ) Email symphony.deltawest@erm.com  
- EDI Format - ESDAT ( ESDAT ) Email symphony.deltawest@erm.com  
- EDI Format - XTab ( XTAB ) Email symphony.deltawest@erm.com

### SYMPHONY ERARING

- \*AU Certificate of Analysis - NATA ( COA ) Email Symphony.Eraring@erm.com  
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI ) Email Symphony.Eraring@erm.com  
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC ) Email Symphony.Eraring@erm.com  
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN ) Email Symphony.Eraring@erm.com  
- A4 - AU Tax Invoice ( INV ) Email Symphony.Eraring@erm.com  
- Chain of Custody (CoC) ( COC ) Email Symphony.Eraring@erm.com  
- EDI Format - ENMRG ( ENMRG ) Email Symphony.Eraring@erm.com  
- EDI Format - ESDAT ( ESDAT ) Email Symphony.Eraring@erm.com  
- EDI Format - XTab ( XTAB ) Email Symphony.Eraring@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV ) Email au.accounts@erm.com



# CHAIN OF CUSTODY

ALS Laboratory  
Please tick

ALS Laboratory  
100 South Street, Suite 100  
Sydney, NSW 2000  
Ph: 02 9211 5000  
Fax: 02 9211 5001  
Email: info@als.com.au

ALS Laboratory  
100 South Street, Suite 100  
Sydney, NSW 2000  
Ph: 02 9211 5000  
Fax: 02 9211 5001  
Email: info@als.com.au

ALS Laboratory  
100 South Street, Suite 100  
Sydney, NSW 2000  
Ph: 02 9211 5000  
Fax: 02 9211 5001  
Email: info@als.com.au

ALS Laboratory  
100 South Street, Suite 100  
Sydney, NSW 2000  
Ph: 02 9211 5000  
Fax: 02 9211 5001  
Email: info@als.com.au

CLIENT: ERM

OFFICE: GROUND FLOOR, 33 SAUNDERS ST, PYRMONT NSW 2009

PROJECT: Symphony - Delta West

ORDER NUMBER: 02074200207423

PROJECT MANAGER: Jonathan Lelawski

SAMPLER: S. J. Smith

COC emailed to ALS? (YES / NO)

Email Reports to (will default to PM if no other addresses are listed):

Email Invoice to (will default to PM if no other addresses are listed):

TURNAROUND REQUIREMENTS:  
 Standard TAT (List due date)  
 Non Standard or urgent TAT (List due date)

ALS QUOTE NO.: SY/531/13 VA

CONTACT PH: 654 8888

SAMPLER MOBILE:

REINQUISHED BY:

DATE/TIME:

RECEIVED BY:

DATE/TIME:

RECEIVED BY:

## CONTAINER INFORMATION

ALS USE: MATRIX: SOLID (S) WATER (W)

ANALYSIS REQUIRED (including SHUT ES (NB. Site Codes must be listed to attract site prices) within brackets are required, specify 'only' (undiluted only required) or 'Dissolved' (field filtered only required))

Additional Information

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (codes below)	(color to)	TOTAL CONTAINERS	W-4 (TPH/TRH (C6-C36 or 40) BTEXN)	8 Ultra Trace Dissolved Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg) -	Additional Metals Ultra Trace - Se, Be, Fl, Mn	Ferrous Iron	PAH/Phenols	VOC Scan	PCB	Cations/Anions	Comments on likely contaminant levels, dilutions or samples requiring specific analysis etc.
1	MP-GM-5/D5	19/11/13	W			7	X	X	X	X	X	X	X	X	
2	ME-MW01					8	X	X	X	X	X	X	X	X	
3	ME-MW02					8	X	X	X	X	X	X	X	X	
4	ME-MW06					8	X	X	X	X	X	X	X	X	

Telephone : +61-2-8784 8555



ES1328000

Environmental Division  
Sydney  
Work Order

Water Container Codes: P = Unpreserved Plastic; R = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airright Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bleach Preserved; VS = VOA Vial Saline Preserved; AV = Airright Unpreserved Vial SS = Sulfide Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speedation bottle; SP = Sulfide Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag

## CERTIFICATE OF ANALYSIS

Work Order	: <b>ES1328001</b>	Page	: 1 of 13
Amendment	: <b>1</b>		
Client	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: SYMPHONY DELTA WEST	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 0207420/0207423		
C-O-C number	: ----	Date Samples Received	: 20-DEC-2013
Sampler	: TS	Issue Date	: 16-JAN-2014
Site	: ----		
Quote number	: SY/551/13 V4	No. of samples received	: 8
		No. of samples analysed	: 8

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EP080: Sample TRIP SPIKE contains volatile compounds spiked into the sample containers prior to dispatch from the laboratory. BTEX compounds spiked at 20 ug/L.**
- **This report has been amended as a result of misinterpretation of sample identification numbers (IDs). All analysis results are as per the previous report**



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

## Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Organics
Raymond Commodor	Instrument Chemist	Sydney Inorganics
Sanjeshni Jyoti Mala	Senior Chemist Volatile	Sydney Organics



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MK_MW05	MK_MW04	MB_MW04	MK_MW08	MK_MW06
				19-DEC-2013 09:41	19-DEC-2013 10:45	19-DEC-2013 12:00	19-DEC-2013 12:30	19-DEC-2013 13:00
Compound	CAS Number	LOR	Unit	ES1328001-001	ES1328001-002	ES1328001-003	ES1328001-004	ES1328001-005
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	----	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	----	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	96	119	315	----	131
Total Alkalinity as CaCO3	----	1	mg/L	96	119	315	----	131
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	157	101	40	----	260
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	50	38	35	----	47
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	40	26	36	----	42
Magnesium	7439-95-4	1	mg/L	20	17	54	----	46
Sodium	7440-23-5	1	mg/L	54	55	33	----	57
Potassium	7440-09-7	1	mg/L	13	9	9	----	12
<b>EG020F: Dissolved Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	----	----	----
Nickel	7440-02-0	0.001	mg/L	0.028	0.018	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	----	----	----
Zinc	7440-66-6	0.005	mg/L	0.013	0.005	----	----	----
Manganese	7439-96-5	0.001	mg/L	1.09	2.91	----	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	----	----	----
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	----	----	----
<b>EG035F: Dissolved Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
<b>EG051G: Ferrous Iron by Discrete Analyser</b>								
Ferrous Iron	----	0.05	mg/L	3.63	13.7	8.79	0.65	15.3
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS</b>								
Selenium	7782-49-2	0.2	µg/L	----	----	<0.2	<0.2	<0.2
Arsenic	7440-38-2	0.2	µg/L	----	----	7.2	2.5	12.5
Boron	7440-42-8	5	µg/L	----	----	18	34	36
Cadmium	7440-43-9	0.05	µg/L	----	----	<0.05	0.12	0.50



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MK_MW05	MK_MW04	MB_MW04	MK_MW08	MK_MW06
				19-DEC-2013 09:41	19-DEC-2013 10:45	19-DEC-2013 12:00	19-DEC-2013 12:30	19-DEC-2013 13:00
Compound	CAS Number	LOR	Unit	ES1328001-001	ES1328001-002	ES1328001-003	ES1328001-004	ES1328001-005
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS - Continued</b>								
Chromium	7440-47-3	0.2	µg/L	----	----	<0.2	0.2	<0.2
Copper	7440-50-8	0.5	µg/L	----	----	<0.5	2.8	1.4
Lead	7439-92-1	0.1	µg/L	----	----	<0.1	9.2	0.7
Manganese	7439-96-5	0.5	µg/L	----	----	3690	4570	5400
Nickel	7440-02-0	0.5	µg/L	----	----	136	174	276
Zinc	7440-66-6	1	µg/L	----	----	19	50	70
<b>EK040P: Fluoride by PC Titrator</b>								
Fluoride	16984-48-8	0.1	mg/L	0.2	<0.1	0.1	----	<0.1
<b>EN055: Ionic Balance</b>								
Total Anions	----	0.01	meq/L	6.60	5.55	8.11	----	9.36
Total Cations	----	0.01	meq/L	6.35	5.53	8.05	----	9.08
Ionic Balance	----	0.01	%	1.96	0.19	0.46	----	1.53
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	1	µg/L	<1	<1	----	----	<1
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	5	µg/L	<5	<5	----	<5	<5
Isopropylbenzene	98-82-8	5	µg/L	<5	<5	----	<5	<5
n-Propylbenzene	103-65-1	5	µg/L	<5	<5	----	<5	<5
1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	----	<5	<5
sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	----	<5	<5
1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	----	<5	<5
tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	----	<5	<5
p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	----	<5	<5
n-Butylbenzene	104-51-8	5	µg/L	<5	<5	----	<5	<5
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	50	µg/L	<50	<50	----	<50	<50
2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	----	<50	<50
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	----	<50	<50
2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	----	<50	<50
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	5	µg/L	<5	<5	----	<5	<5
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	----	<5	<5



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MK_MW05	MK_MW04	MB_MW04	MK_MW08	MK_MW06
				19-DEC-2013 09:41	19-DEC-2013 10:45	19-DEC-2013 12:00	19-DEC-2013 12:30	19-DEC-2013 13:00
Compound	CAS Number	LOR	Unit	ES1328001-001	ES1328001-002	ES1328001-003	ES1328001-004	ES1328001-005
<b>EP074D: Fumigants - Continued</b>								
1.2-Dichloropropane	78-87-5	5	µg/L	<5	<5	----	<5	<5
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	----	<5	<5
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	----	<5	<5
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	----	<5	<5
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	----	<50	<50
Chloromethane	74-87-3	50	µg/L	<50	<50	----	<50	<50
Vinyl chloride	75-01-4	50	µg/L	<50	<50	----	<50	<50
Bromomethane	74-83-9	50	µg/L	<50	<50	----	<50	<50
Chloroethane	75-00-3	50	µg/L	<50	<50	----	<50	<50
Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	----	<50	<50
1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	----	<5	<5
Iodomethane	74-88-4	5	µg/L	<5	<5	----	<5	<5
trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	----	<5	<5
1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	----	<5	<5
cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	----	<5	<5
1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	----	<5	<5
1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	----	<5	<5
Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	----	<5	<5
1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	----	<5	<5
Trichloroethene	79-01-6	5	µg/L	<5	<5	----	<5	<5
Dibromomethane	74-95-3	5	µg/L	<5	<5	----	<5	<5
1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	----	<5	<5
1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	----	<5	<5
Tetrachloroethene	127-18-4	5	µg/L	<5	<5	----	<5	<5
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	----	<5	<5
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	----	<5	<5
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	----	<5	<5
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	----	<5	<5
1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	----	<5	<5
Pentachloroethane	76-01-7	5	µg/L	<5	<5	----	<5	<5
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	----	<5	<5
Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	----	<5	<5





## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MK_MW05	MK_MW04	MB_MW04	MK_MW08	MK_MW06
				19-DEC-2013 09:41	19-DEC-2013 10:45	19-DEC-2013 12:00	19-DEC-2013 12:30	19-DEC-2013 13:00
Compound	CAS Number	LOR	Unit	ES1328001-001	ES1328001-002	ES1328001-003	ES1328001-004	ES1328001-005
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	5	µg/L	<5	<5	----	<5	<5
Bromobenzene	108-86-1	5	µg/L	<5	<5	----	<5	<5
2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	----	<5	<5
4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	----	<5	<5
1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	----	<5	<5
1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	----	<5	<5
1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	----	<5	<5
1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	----	<5	<5
1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	----	<5	<5
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	5	µg/L	<5	<5	----	<5	<5
Bromodichloromethane	75-27-4	5	µg/L	<5	<5	----	<5	<5
Dibromochloromethane	124-48-1	5	µg/L	<5	<5	----	<5	<5
Bromoform	75-25-2	5	µg/L	<5	<5	----	<5	<5
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	7	µg/L	<7	<7	----	<7	<7
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	<1.0	----	<1.0
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	<1.0	----	<1.0
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	<1.0	----	<1.0
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	<2.0	----	<2.0
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	<1.0	----	<1.0
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	<1.0	----	<1.0
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	<1.0	----	<1.0
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	<1.0	----	<1.0
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	<1.0	----	<1.0
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	<1.0	----	<1.0
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	<1.0	----	<1.0
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	<2.0	----	<2.0
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	----	<1.0
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	----	<1.0
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	----	<1.0



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MK_MW05	MK_MW04	MB_MW04	MK_MW08	MK_MW06
				19-DEC-2013 09:41	19-DEC-2013 10:45	19-DEC-2013 12:00	19-DEC-2013 12:30	19-DEC-2013 13:00
Compound	CAS Number	LOR	Unit	ES1328001-001	ES1328001-002	ES1328001-003	ES1328001-004	ES1328001-005
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	----	<1.0
Phenanthrene	85-01-8	1.0	µg/L	1.7	<1.0	<1.0	----	<1.0
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	----	<1.0
Fluoranthene	206-44-0	1.0	µg/L	1.4	<1.0	<1.0	----	<1.0
Pyrene	129-00-0	1.0	µg/L	1.1	<1.0	<1.0	----	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	----	<1.0
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	----	<1.0
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	<1.0	----	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	----	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	----	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	----	<1.0
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	----	<1.0
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	----	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	4.2	<0.5	<0.5	----	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	<0.5	----	<0.5
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	----	<50
C15 - C28 Fraction	----	100	µg/L	150	<100	<100	----	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	----	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	150	<50	<50	----	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	<100	----	<100
>C16 - C34 Fraction	----	100	µg/L	170	<100	<100	----	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	----	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	170	<100	<100	----	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	----	<100
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MK_MW05	MK_MW04	MB_MW04	MK_MW08	MK_MW06
				19-DEC-2013 09:41	19-DEC-2013 10:45	19-DEC-2013 12:00	19-DEC-2013 12:30	19-DEC-2013 13:00
Compound	CAS Number	LOR	Unit	ES1328001-001	ES1328001-002	ES1328001-003	ES1328001-004	ES1328001-005
<b>EP080: BTEXN - Continued</b>								
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	58.0	82.0	----	----	70.0
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	109	113	----	102	118
Toluene-D8	2037-26-5	0.1	%	106	103	----	85.7	92.4
4-Bromofluorobenzene	460-00-4	0.1	%	112	116	----	97.1	110
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	15.4	21.7	16.3	----	15.5
2-Chlorophenol-D4	93951-73-6	0.1	%	34.5	45.7	36.2	----	33.7
2,4,6-Tribromophenol	118-79-6	0.1	%	67.5	77.6	52.3	----	54.1
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	51.0	73.6	46.7	----	50.5
Anthracene-d10	1719-06-8	0.1	%	76.8	80.4	74.4	----	68.4
4-Terphenyl-d14	1718-51-0	0.1	%	95.9	91.1	83.7	----	77.1
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	123	129	120	115	116
Toluene-D8	2037-26-5	0.1	%	107	104	128	107	115
4-Bromofluorobenzene	460-00-4	0.1	%	108	99.9	111	90.8	101



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				ME_MW05	TS4	TB3	----	----
				19-DEC-2013 14:17	19-DEC-2013 13:00	19-DEC-2013 13:00	----	----
Compound	CAS Number	LOR	Unit	ES1328001-006	ES1328001-007	ES1328001-008	----	----
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	283	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	283	----	----	----	----
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	85	----	----	----	----
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	44	----	----	----	----
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	25	----	----	----	----
Magnesium	7439-95-4	1	mg/L	61	----	----	----	----
Sodium	7440-23-5	1	mg/L	38	----	----	----	----
Potassium	7440-09-7	1	mg/L	8	----	----	----	----
<b>EG035F: Dissolved Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
<b>EG051G: Ferrous Iron by Discrete Analyser</b>								
Ferrous Iron	----	0.05	mg/L	4.51	----	----	----	----
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS</b>								
Selenium	7782-49-2	0.2	µg/L	<0.2	----	----	----	----
Arsenic	7440-38-2	0.2	µg/L	3.4	----	----	----	----
Boron	7440-42-8	5	µg/L	22	----	----	----	----
Cadmium	7440-43-9	0.05	µg/L	0.08	----	----	----	----
Chromium	7440-47-3	0.2	µg/L	<0.2	----	----	----	----
Copper	7440-50-8	0.5	µg/L	<0.5	----	----	----	----
Lead	7439-92-1	0.1	µg/L	<0.1	----	----	----	----
Manganese	7439-96-5	0.5	µg/L	9680	----	----	----	----
Nickel	7440-02-0	0.5	µg/L	109	----	----	----	----
Zinc	7440-66-6	1	µg/L	42	----	----	----	----
<b>EK040P: Fluoride by PC Titrator</b>								
Fluoride	16984-48-8	0.1	mg/L	0.1	----	----	----	----
<b>EN055: Ionic Balance</b>								
Total Anions	----	0.01	meq/L	8.67	----	----	----	----
Total Cations	----	0.01	meq/L	8.58	----	----	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				ME_MW05	TS4	TB3	---	---
				19-DEC-2013 14:17	19-DEC-2013 13:00	19-DEC-2013 13:00	---	---
				ES1328001-006	ES1328001-007	ES1328001-008	---	---
Compound	CAS Number	LOR	Unit					
<b>EN055: Ionic Balance - Continued</b>								
Ionic Balance	---	0.01	%	0.55	---	---	---	---
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	1.0	µg/L	<1.0	---	---	---	---
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	---	---	---	---
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	---	---	---	---
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	---	---	---	---
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	---	---	---	---
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	---	---	---	---
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	---	---	---	---
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	---	---	---	---
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	---	---	---	---
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	---	---	---	---
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	---	---	---	---
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	---	---	---	---
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	1.0	µg/L	<1.0	---	---	---	---
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	---	---	---	---
Acenaphthene	83-32-9	1.0	µg/L	<1.0	---	---	---	---
Fluorene	86-73-7	1.0	µg/L	<1.0	---	---	---	---
Phenanthrene	85-01-8	1.0	µg/L	<1.0	---	---	---	---
Anthracene	120-12-7	1.0	µg/L	<1.0	---	---	---	---
Fluoranthene	206-44-0	1.0	µg/L	<1.0	---	---	---	---
Pyrene	129-00-0	1.0	µg/L	<1.0	---	---	---	---
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	---	---	---	---
Chrysene	218-01-9	1.0	µg/L	<1.0	---	---	---	---
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	---	---	---	---
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	---	---	---	---
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	---	---	---	---
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	---	---	---	---
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	---	---	---	---
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	---	---	---	---
^ Sum of polycyclic aromatic hydrocarbons	---	0.5	µg/L	<0.5	---	---	---	---
^ Benzo(a)pyrene TEQ (zero)	---	0.5	µg/L	<0.5	---	---	---	---



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				ME_MW05	TS4	TB3	---	---
Client sampling date / time				19-DEC-2013 14:17	19-DEC-2013 13:00	19-DEC-2013 13:00	---	---
Compound	CAS Number	LOR	Unit	ES1328001-006	ES1328001-007	ES1328001-008	---	---
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	20	µg/L	<20	----	<20	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	<20	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	----	<20	----	----
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	----	----	----	----
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	<1	18	<1	----	----
Toluene	108-88-3	2	µg/L	<2	18	<2	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	17	<2	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	17	<2	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	17	<2	----	----
^ Total Xylenes	1330-20-7	2	µg/L	<2	34	<2	----	----
^ Sum of BTEX	----	1	µg/L	<1	87	<1	----	----
Naphthalene	91-20-3	5	µg/L	<5	19	<5	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	16.0	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	36.3	----	----	----	----
2,4,6-Tribromophenol	118-79-6	0.1	%	54.5	----	----	----	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	48.8	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%	72.7	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	81.1	----	----	----	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	100	109	113	----	----



### Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

ME_MW05	TS4	TB3	---	---
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Client sampling date / time

19-DEC-2013 14:17	19-DEC-2013 13:00	19-DEC-2013 13:00	---	---
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Compound	CAS Number	LOR	Unit	ES1328001-006	ES1328001-007	ES1328001-008	---	---
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#### EP080S: TPH(V)/BTEX Surrogates - Continued

Toluene-D8	2037-26-5	0.1	%	104	113	116	---	---
4-Bromofluorobenzene	460-00-4	0.1	%	96.2	108	109	---	---





## Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP066S: PCB Surrogate</b>			
Decachlorobiphenyl	2051-24-3	28.5	129
<b>EP074S: VOC Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	78.3	133.2
Toluene-D8	2037-26-5	79.1	128.9
4-Bromofluorobenzene	460-00-4	80.8	123.7
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	10.0	44
2-Chlorophenol-D4	93951-73-6	14	94
2,4,6-Tribromophenol	118-79-6	17	125
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27.4	113
4-Terphenyl-d14	1718-51-0	32	112
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

## QUALITY CONTROL REPORT

Work Order	: <b>ES1328001</b>	Page	: 1 of 18
Amendment	: <b>1</b>		
Client	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: SYMPHONY DELTA WEST	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 20-DEC-2013
Sampler	: TS	Issue Date	: 16-JAN-2014
Order number	: 0207420/0207423		
Quote number	: SY/551/13 V4	No. of samples received	: 8
		No. of samples analysed	: 8

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :  
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
RPD = Relative Percentage Difference  
# = Indicates failed QC



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

## Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Organics
Raymond Commodor	Instrument Chemist	Sydney Inorganics
Sanjeshni Jyoti Mala	Senior Chemist Volatile	Sydney Organics



## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>ED037P: Alkalinity by PC Titrator (QC Lot: 3225580)</b>									
ES1327988-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	657	661	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	657	661	0.6	0% - 20%
ES1327989-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	98	99	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	98	99	0.0	0% - 20%
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3225535)</b>									
ES1328001-001	MK_MW05	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	157	156	0.0	0% - 20%
ES1328002-005	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	46	44	3.6	0% - 20%
<b>ED045G: Chloride Discrete analyser (QC Lot: 3225534)</b>									
ES1328001-001	MK_MW05	ED045G: Chloride	16887-00-6	1	mg/L	50	51	0.0	0% - 20%
ES1328002-005	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	282	281	0.0	0% - 20%
<b>ED093F: Dissolved Major Cations (QC Lot: 3225533)</b>									
ES1328001-001	MK_MW05	ED093F: Calcium	7440-70-2	1	mg/L	40	40	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	20	20	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	44	44	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	13	13	0.0	0% - 50%
ES1328109-046	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	2	2	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	2	2	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	45	46	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	6	6	0.0	No Limit
<b>EG020F: Dissolved Metals by ICP-MS (QC Lot: 3231747)</b>									
ES1327914-003	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.002	0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.001	0.002	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.010	70.7	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	0.01	0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	0.33	0.32	5.4	No Limit
ES1328001-002	MK_MW04	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG020F: Dissolved Metals by ICP-MS (QC Lot: 3231747) - continued</b>									
ES1328001-002	MK_MW04	EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	2.91	2.69	7.9	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.018	0.018	0.0	0% - 50%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.005	0.005	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.0	No Limit
<b>EG035F: Dissolved Mercury by FIMS (QC Lot: 3231746)</b>									
ES1327914-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1328001-002	MK_MW04	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
<b>EG051G: Ferrous Iron by Discrete Analyser (QC Lot: 3229115)</b>									
ES1328000-004	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	16.7	16.7	0.06	0% - 20%
ES1328002-003	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	3.04	3.03	0.4	0% - 20%
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 3228353)</b>									
ES1327851-001	Anonymous	EG094A-F: Cadmium	7440-43-9	0.05	µg/L	0.10	0.10	0.0	No Limit
		EG094A-F: Lead	7439-92-1	0.1	µg/L	1.0	0.9	0.0	No Limit
		EG094A-F: Arsenic	7440-38-2	0.2	µg/L	0.2	<0.2	0.0	No Limit
		EG094A-F: Chromium	7440-47-3	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG094A-F: Copper	7440-50-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG094A-F: Manganese	7439-96-5	0.5	µg/L	1750	1700	2.7	0% - 20%
		EG094A-F: Nickel	7440-02-0	0.5	µg/L	126	123	2.5	0% - 20%
		EG094A-F: Zinc	7440-66-6	1	µg/L	434	425	2.2	0% - 20%
		EG094A-F: Boron	7440-42-8	5	µg/L	45	44	0.0	No Limit
ES1328000-002	Anonymous	EG094A-F: Cadmium	7440-43-9	0.05	µg/L	0.13	0.12	0.0	No Limit
		EG094A-F: Lead	7439-92-1	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG094A-F: Arsenic	7440-38-2	0.2	µg/L	1.6	1.7	0.0	No Limit
		EG094A-F: Chromium	7440-47-3	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG094A-F: Copper	7440-50-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG094A-F: Manganese	7439-96-5	0.5	µg/L	9090	8990	1.1	0% - 20%
		EG094A-F: Nickel	7440-02-0	0.5	µg/L	80.5	81.0	0.6	0% - 20%
		EG094A-F: Zinc	7440-66-6	1	µg/L	18	18	0.0	0% - 50%
		EG094A-F: Boron	7440-42-8	5	µg/L	18	18	0.0	No Limit
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 3228354)</b>									
ES1327851-001	Anonymous	EG094B-F: Selenium	7782-49-2	0.2	µg/L	0.3	<0.2	50.2	No Limit
ES1328000-002	Anonymous	EG094B-F: Selenium	7782-49-2	0.2	µg/L	<0.2	<0.2	0.0	No Limit
<b>EK040P: Fluoride by PC Titrator (QC Lot: 3225581)</b>									
ES1327989-002	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EK040P: Fluoride by PC Titrator (QC Lot: 3225581) - continued</b>									
ES1328000-002	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.0	No Limit
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3229797)</b>									
ES1327989-001	Anonymous	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
ES1328001-001	MK_MW05	EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
ES1328001-001	MK_MW05	EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
		<b>EP074B: Oxygenated Compounds (QC Lot: 3229797)</b>							
		ES1327989-001	Anonymous	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50
EP074: 2-Butanone (MEK)	78-93-3			50	µg/L	<50	<50	0.0	No Limit
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1			50	µg/L	<50	<50	0.0	No Limit
EP074: 2-Hexanone (MBK)	591-78-6			50	µg/L	<50	<50	0.0	No Limit
ES1328001-001	MK_MW05	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
<b>EP074C: Sulfonated Compounds (QC Lot: 3229797)</b>									
ES1327989-001	Anonymous	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
ES1328001-001	MK_MW05	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
<b>EP074D: Fumigants (QC Lot: 3229797)</b>									
ES1327989-001	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
ES1328001-001	MK_MW05	EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report							
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)		
<b>EP074D: Fumigants (QC Lot: 3229797) - continued</b>											
ES1328001-001	MK_MW05	EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit		
		EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit		
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3229797)</b>											
ES1327989-001	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit		
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit		
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit		
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit		
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit		
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit		
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit		
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit		
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit		
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit		
		ES1328001-001	MK_MW05	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
				EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
EP074: trans-1.2-Dichloroethene	156-60-5			5	µg/L	<5	<5	0.0	No Limit		
EP074: 1.1-Dichloroethane	75-34-3			5	µg/L	<5	<5	0.0	No Limit		
EP074: cis-1.2-Dichloroethene	156-59-2			5	µg/L	<5	<5	0.0	No Limit		
EP074: 1.1.1-Trichloroethane	71-55-6			5	µg/L	<5	<5	0.0	No Limit		
EP074: 1.1-Dichloropropylene	563-58-6			5	µg/L	<5	<5	0.0	No Limit		
EP074: Carbon Tetrachloride	56-23-5			5	µg/L	<5	<5	0.0	No Limit		





Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3229797) - continued</b>									
ES1328001-001	MK_MW05	EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit		
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit		
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3229797)</b>									
ES1327989-001	Anonymous	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
		ES1328001-001	MK_MW05	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5
EP074: Bromobenzene	108-86-1			5	µg/L	<5	<5	0.0	No Limit
EP074: 2-Chlorotoluene	95-49-8			5	µg/L	<5	<5	0.0	No Limit
EP074: 4-Chlorotoluene	106-43-4			5	µg/L	<5	<5	0.0	No Limit
EP074: 1,3-Dichlorobenzene	541-73-1			5	µg/L	<5	<5	0.0	No Limit
EP074: 1,4-Dichlorobenzene	106-46-7			5	µg/L	<5	<5	0.0	No Limit
EP074: 1,2-Dichlorobenzene	95-50-1			5	µg/L	<5	<5	0.0	No Limit
EP074: 1,2,4-Trichlorobenzene	120-82-1			5	µg/L	<5	<5	0.0	No Limit
EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit		

**EP074G: Trihalomethanes (QC Lot: 3229797)**



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
<b>EP074G: Trihalomethanes (QC Lot: 3229797) - continued</b>										
ES1327989-001	Anonymous	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit	
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit	
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit	
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit	
ES1328001-001	MK_MW05	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit	
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit	
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit	
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit	
<b>EP074H: Naphthalene (QC Lot: 3229797)</b>										
ES1327989-001	Anonymous	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit	
ES1328001-001	MK_MW05	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3229798)</b>										
ES1327989-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit	
ES1328001-001	MK_MW05	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3229802)</b>										
ES1327901-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit	
ES1328000-002	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3229798)</b>										
ES1327989-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit	
ES1328001-001	MK_MW05	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3229802)</b>										
ES1327901-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit	
ES1328000-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit	
<b>EP080: BTEXN (QC Lot: 3229798)</b>										
ES1327989-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit	
ES1328001-001	MK_MW05	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit	
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit	
EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit			
<b>EP080: BTEXN (QC Lot: 3229802)</b>										



Sub-Matrix: <b>WATER</b>				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP080: BTEXN (QC Lot: 3229802) - continued</b>									
ES1327901-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES1328000-002	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit



## Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
<b>ED037P: Alkalinity by PC Titrator (QCLot: 3225580)</b>								
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	----	200 mg/L	97.3	81	111
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3225535)</b>								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	105	86	122
<b>ED045G: Chloride Discrete analyser (QCLot: 3225534)</b>								
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	109	77	123
<b>ED093F: Dissolved Major Cations (QCLot: 3225533)</b>								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	87	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.2	89	113
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.3	79	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	101	87	115
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3231747)</b>								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	86.2	80	118
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	97.4	82	112
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	89.5	81	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	84.2	80	112
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	96.3	83	111
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	92.0	81	113
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	91.3	81	113
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	99.8	73	125
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	88.5	80	116
EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.1 mg/L	101	69	123
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3231746)</b>								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	102	78	114
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3229115)</b>								
EG051G: Ferrous Iron	----	0.10	mg/L	<0.10	2.00 mg/L	109	89	113
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3228353)</b>								
EG094A-F: Arsenic	7440-38-2	0.2	µg/L	<0.2	10 µg/L	92.3	75	129
EG094A-F: Boron	7440-42-8	5	µg/L	<5	10 µg/L	121	79	129
EG094A-F: Cadmium	7440-43-9	0.05	µg/L	<0.05	10 µg/L	99.6	78	112
EG094A-F: Chromium	7440-47-3	0.2	µg/L	<0.2	10 µg/L	98.1	71	123
EG094A-F: Copper	7440-50-8	0.5	µg/L	<0.5	10 µg/L	101	77	125
EG094A-F: Lead	7439-92-1	0.1	µg/L	<0.1	10 µg/L	89.2	74	118
EG094A-F: Manganese	7439-96-5	0.5	µg/L	<0.5	10 µg/L	95.1	79	119
EG094A-F: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	109	72	128



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3228353) - continued</b>									
EG094A-F: Zinc	7440-66-6	1	µg/L	<1	10 µg/L	109	76	134	
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3228354)</b>									
EG094B-F: Selenium	7782-49-2	0.2	µg/L	<0.2	10 µg/L	106	75	125	
<b>EK040P: Fluoride by PC Titrator (QCLot: 3225581)</b>									
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5.0 mg/L	94.8	75	119	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3227506)</b>									
EP066: Total Polychlorinated biphenyls	----	1	µg/L	<1	10 µg/L	83.0	61.6	107	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3229797)</b>									
EP074: Styrene	100-42-5	5	µg/L	<5	10 µg/L	104	74	118	
EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	10 µg/L	108	75	121	
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	10 µg/L	111	67	123	
EP074: 1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	10 µg/L	107	70	122	
EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	10 µg/L	111	69	123	
EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	10 µg/L	109	71	121	
EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	10 µg/L	110	70	122	
EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	10 µg/L	109	67	123	
EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	10 µg/L	110	62	126	
<b>EP074B: Oxygenated Compounds (QCLot: 3229797)</b>									
EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	100 µg/L	104	61.4	134	
EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	100 µg/L	105	73.6	130	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	100 µg/L	104	61	139	
EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	100 µg/L	104	65	137	
<b>EP074C: Sulfonated Compounds (QCLot: 3229797)</b>									
EP074: Carbon disulfide	75-15-0	5	µg/L	<5	10 µg/L	97.2	72.8	127	
<b>EP074D: Fumigants (QCLot: 3229797)</b>									
EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	10 µg/L	103	61	119	
EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	10 µg/L	110	76	120	
EP074: cis-1,3-Dichloropropylene	10061-01-5	10	µg/L	<10	10 µg/L	91.7	62	120	
EP074: trans-1,3-Dichloropropylene	10061-02-6	10	µg/L	<10	10 µg/L	94.7	61	119	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	10 µg/L	105	69	117	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3229797)</b>									
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	100 µg/L	114	60.6	138	
EP074: Chloromethane	74-87-3	50	µg/L	<50	100 µg/L	118	67.4	130	
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	100 µg/L	# 130	69.4	129	
EP074: Bromomethane	74-83-9	50	µg/L	<50	100 µg/L	116	56	140	
EP074: Chloroethane	75-00-3	50	µg/L	<50	100 µg/L	123	63	135	
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	100 µg/L	119	65	131	
EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	10 µg/L	104	69	123	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3229797) - continued</b>									
EP074: Iodomethane	74-88-4	5	µg/L	<5	10 µg/L	102	70.2	128	
EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	10 µg/L	109	71	119	
EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	10 µg/L	112	75	119	
EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	10 µg/L	111	77	117	
EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	10 µg/L	103	61	119	
EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	10 µg/L	109	73	119	
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	10 µg/L	98.5	63	121	
EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	10 µg/L	118	78	122	
EP074: Trichloroethene	79-01-6	5	µg/L	<5	10 µg/L	107	74	120	
EP074: Dibromomethane	74-95-3	5	µg/L	<5	10 µg/L	105	74	118	
EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	10 µg/L	110	75	123	
EP074: 1,3-Dichloropropane	142-28-9	5	µg/L	<5	10 µg/L	107	79	121	
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	10 µg/L	108	72	124	
EP074: 1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	10 µg/L	95.5	66	114	
EP074: trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	10 µg/L	101	60	120	
EP074: cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	10 µg/L	95.2	70.6	128	
EP074: 1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	10 µg/L	103	70	124	
EP074: 1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	10 µg/L	113	74	128	
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	10 µg/L	87.4	71.8	126	
EP074: 1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	10 µg/L	86.1	66.4	136	
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	10 µg/L	117	58	132	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3229797)</b>									
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	10 µg/L	116	80	118	
EP074: Bromobenzene	108-86-1	5	µg/L	<5	10 µg/L	105	76	116	
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	10 µg/L	115	71	121	
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	10 µg/L	111	71	121	
EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	10 µg/L	112	74	120	
EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	10 µg/L	115	72	120	
EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	10 µg/L	110	77	117	
EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	10 µg/L	112	60	126	
EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	10 µg/L	118	67	125	
<b>EP074G: Trihalomethanes (QCLot: 3229797)</b>									
EP074: Chloroform	67-66-3	5	µg/L	<5	10 µg/L	113	76	118	
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	10 µg/L	100	64	118	
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	10 µg/L	95.3	65	115	
EP074: Bromoform	75-25-2	5	µg/L	<5	10 µg/L	90.9	73.5	126	
<b>EP074H: Naphthalene (QCLot: 3229797)</b>									
EP074: Naphthalene	91-20-3	7	µg/L	<7	10 µg/L	92.6	61	125	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3227508)</b>									
EP075(SIM): Phenol	108-95-2	0.2	µg/L	----	5 µg/L	36.8	24.5	61.9	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Chlorophenol	95-57-8	0.2	µg/L	----	5 µg/L	67.4	63.8	110	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Methylphenol	95-48-7	0.2	µg/L	----	5 µg/L	68.6	55.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	0.4	µg/L	----	10 µg/L	59.8	42.5	114	
		2	µg/L	<2.0	----	----	----	----	
EP075(SIM): 2-Nitrophenol	88-75-5	0.2	µg/L	----	5 µg/L	69.0	62.7	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.2	µg/L	----	5 µg/L	63.2	59.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.2	µg/L	----	5 µg/L	67.4	59.3	122	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.2	µg/L	----	5 µg/L	96.0	64.3	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.2	µg/L	----	5 µg/L	64.5	63	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.2	µg/L	----	5 µg/L	75.6	58.7	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.2	µg/L	----	5 µg/L	76.4	50	108	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Pentachlorophenol	87-86-5	0.4	µg/L	----	10 µg/L	81.7	8.7	95	
		2	µg/L	<2.0	----	----	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3227508)</b>									
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	5 µg/L	63.3	58.6	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	5 µg/L	73.5	63.6	114	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	5 µg/L	69.4	62.2	113	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	5 µg/L	74.3	63.9	115	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	5 µg/L	92.4	62.6	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	5 µg/L	112	64.3	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	5 µg/L	106	63.6	118	
		1	µg/L	<1.0	----	----	----	----	





Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike	Spike Recovery (%)	Recovery Limits (%)	
					Concentration	LCS	Low	High
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3227508) - continued</b>								
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	5 µg/L	103	63.1	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	5 µg/L	97.8	64.1	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	5 µg/L	102	62.5	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	5 µg/L	91.9	61.7	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	5 µg/L	95.6	61.7	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	5 µg/L	92.4	63.3	117
		0.5	µg/L	<0.5	----	----	----	----
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	5 µg/L	93.4	59.9	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	----	5 µg/L	95.2	61.2	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	----	5 µg/L	99.3	59.1	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	1	µg/L	<1.0	----	----	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3227507)</b>								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	90.5	59	129
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	105	71	131
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	83.4	62	120
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229798)</b>								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	126	75	127
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229802)</b>								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	103	75	127
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3227507)</b>								
EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	2500 µg/L	74.3	58.9	131
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	103	73.9	138
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
		50	µg/L	----	1500 µg/L	80.3	67	127
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229798)</b>								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	127	75	127
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229802)</b>								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	104	75	127
<b>EP080: BTEXN (QCLot: 3229798)</b>								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	123	70	124
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	118	65	129



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EP080: BTEXN (QCLot: 3229798) - continued</b>									
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	112	70	120	
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	111	69	121	
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	112	72	122	
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	109	70	124	
<b>EP080: BTEXN (QCLot: 3229802)</b>									
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	112	70	124	
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	102	65	129	
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	99.2	70	120	
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	101	69	121	
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	104	72	122	
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	108	70	124	

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report				
				Spike Concentration	Spike Recovery(%)		Recovery Limits (%)	
					MS	Low	High	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3225535)</b>								
ES1328001-001	MK_MW05	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130	
<b>ED045G: Chloride Discrete analyser (QCLot: 3225534)</b>								
ES1328001-001	MK_MW05	ED045G: Chloride	16887-00-6	250 mg/L	98.2	70	130	
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3231747)</b>								
ES1327914-004	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	96.7	70	130	
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	91.3	70	130	
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	79.8	70	130	
		EG020A-F: Copper	7440-50-8	0.2 mg/L	85.0	70	130	
		EG020A-F: Lead	7439-92-1	0.2 mg/L	86.8	70	130	
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	85.3	70	130	
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	77.4	70	130	
EG020A-F: Zinc	7440-66-6	0.2 mg/L	90.8	70	130			
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3231746)</b>								
ES1327914-002	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	91.3	70	130	
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3229115)</b>								



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3229115) - continued</b>							
ES1328000-004	Anonymous	EG051G: Ferrous Iron	----	1.00 mg/L	# Not Determined	68	128
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3228353)</b>							
ES1328000-001	Anonymous	EG094A-F: Arsenic	7440-38-2	50 µg/L	124	70	130
		EG094A-F: Cadmium	7440-43-9	12.5 µg/L	105	70	130
		EG094A-F: Chromium	7440-47-3	50 µg/L	107	70	130
		EG094A-F: Copper	7440-50-8	50 µg/L	103	70	130
		EG094A-F: Lead	7439-92-1	50 µg/L	94.2	70	130
		EG094A-F: Manganese	7439-96-5	50 µg/L	# Not Determined	70	130
		EG094A-F: Nickel	7440-02-0	50 µg/L	112	70	130
		EG094A-F: Zinc	7440-66-6	50 µg/L	113	70	130
<b>EK040P: Fluoride by PC Titrator (QCLot: 3225581)</b>							
ES1327989-002	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	103	70	130
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3229797)</b>							
ES1327989-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	25 µg/L	110	70	130
		EP074: Trichloroethene	79-01-6	25 µg/L	120	70	130
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3229797)</b>							
ES1327989-001	Anonymous	EP074: Chlorobenzene	108-90-7	25 µg/L	125	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229798)</b>							
ES1327989-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	112	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229802)</b>							
ES1327901-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	106	70	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229798)</b>							
ES1327989-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	113	70	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229802)</b>							
ES1327901-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	108	70	130
<b>EP080: BTEXN (QCLot: 3229798)</b>							
ES1327989-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	109	70	130
		EP080: Toluene	108-88-3	25 µg/L	110	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	116	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	106	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	114	70	130
		EP080: Naphthalene	91-20-3	25 µg/L	113	70	130
<b>EP080: BTEXN (QCLot: 3229802)</b>							



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EP080: BTEXN (QCLot: 3229802) - continued</b>							
ES1327901-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	107	70	130
		EP080: Toluene	108-88-3	25 µg/L	104	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	104	70	130
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	102	70	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	25 µg/L	105	70	130
		EP080: Naphthalene	91-20-3	25 µg/L	101	70	130

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
<b>ED045G: Chloride Discrete analyser (QCLot: 3225534)</b>										
ES1328001-001	MK_MW05	ED045G: Chloride	16887-00-6	250 mg/L	98.2	----	70	130	----	----
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3225535)</b>										
ES1328001-001	MK_MW05	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	----	70	130	----	----
<b>EK040P: Fluoride by PC Titrator (QCLot: 3225581)</b>										
ES1327989-002	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	103	----	70	130	----	----
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3228353)</b>										
ES1328000-001	Anonymous	EG094A-F: Arsenic	7440-38-2	50 µg/L	124	----	70	130	----	----
		EG094A-F: Cadmium	7440-43-9	12.5 µg/L	105	----	70	130	----	----
		EG094A-F: Chromium	7440-47-3	50 µg/L	107	----	70	130	----	----
		EG094A-F: Copper	7440-50-8	50 µg/L	103	----	70	130	----	----
		EG094A-F: Lead	7439-92-1	50 µg/L	94.2	----	70	130	----	----
		EG094A-F: Manganese	7439-96-5	50 µg/L	# Not Determined	----	70	130	----	----
		EG094A-F: Nickel	7440-02-0	50 µg/L	112	----	70	130	----	----
		EG094A-F: Zinc	7440-66-6	50 µg/L	113	----	70	130	----	----
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3229115)</b>										
ES1328000-004	Anonymous	EG051G: Ferrous Iron	----	1.00 mg/L	# Not Determined	----	68	128	----	----
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3229797)</b>										
ES1327989-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	25 µg/L	110	----	70	130	----	----
		EP074: Trichloroethene	79-01-6	25 µg/L	120	----	70	130	----	----



Sub-Matrix: WATER

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
					MS	MSD	Low	High	Value	Control Limit	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3229797)</b>											
ES1327989-001	Anonymous	EP074: Chlorobenzene	108-90-7	25 µg/L	125	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229798)</b>											
ES1327989-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	112	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229798)</b>											
ES1327989-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	113	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3229798)</b>											
ES1327989-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	109	----	70	130	----	----	
		EP080: Toluene	108-88-3	25 µg/L	110	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	25 µg/L	116	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	106	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	25 µg/L	114	----	70	130	----	----	
		EP080: Naphthalene	91-20-3	25 µg/L	113	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229802)</b>											
ES1327901-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	106	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229802)</b>											
ES1327901-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	108	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3229802)</b>											
ES1327901-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	107	----	70	130	----	----	
		EP080: Toluene	108-88-3	25 µg/L	104	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	25 µg/L	104	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	102	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	25 µg/L	105	----	70	130	----	----	
		EP080: Naphthalene	91-20-3	25 µg/L	101	----	70	130	----	----	
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3231746)</b>											
ES1327914-002	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	91.3	----	70	130	----	----	
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3231747)</b>											
ES1327914-004	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	96.7	----	70	130	----	----	
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	91.3	----	70	130	----	----	
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	79.8	----	70	130	----	----	
		EG020A-F: Copper	7440-50-8	0.2 mg/L	85.0	----	70	130	----	----	
		EG020A-F: Lead	7439-92-1	0.2 mg/L	86.8	----	70	130	----	----	
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	85.3	----	70	130	----	----	
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	77.4	----	70	130	----	----	
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	90.8	----	70	130	----	----	

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1328001</b>	Page	: 1 of 10
Amendment	: <b>1</b>		
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
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Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: SYMPHONY DELTA WEST	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 20-DEC-2013
Sampler	: TS	Issue Date	: 16-JAN-2014
Order number	: 0207420/0207423		
Quote number	: SY/551/13 V4	No. of samples received	: 8
		No. of samples analysed	: 8

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER** Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>ED037P: Alkalinity by PC Titrator</b>								
<b>Clear Plastic Bottle - Natural (ED037-P)</b> MK_MW05, MB_MW04, ME_MW05	MK_MW04, MK_MW06	19-DEC-2013	---	02-JAN-2014	----	21-DEC-2013	02-JAN-2014	✓
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
<b>Clear Plastic Bottle - Natural (ED041G)</b> MK_MW05, MB_MW04, ME_MW05	MK_MW04, MK_MW06	19-DEC-2013	---	16-JAN-2014	----	21-DEC-2013	16-JAN-2014	✓
<b>ED045G: Chloride Discrete analyser</b>								
<b>Clear Plastic Bottle - Natural (ED045G)</b> MK_MW05, MB_MW04, ME_MW05	MK_MW04, MK_MW06	19-DEC-2013	---	16-JAN-2014	----	21-DEC-2013	16-JAN-2014	✓
<b>ED093F: Dissolved Major Cations</b>								
<b>Clear Plastic Bottle - Natural (ED093F)</b> MK_MW05, MB_MW04, ME_MW05	MK_MW04, MK_MW06	19-DEC-2013	---	26-DEC-2013	----	21-DEC-2013	26-DEC-2013	✓
<b>EG020F: Dissolved Metals by ICP-MS</b>								
<b>Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F)</b> MK_MW05,	MK_MW04	19-DEC-2013	---	17-JUN-2014	----	30-DEC-2013	17-JUN-2014	✓
<b>EG035F: Dissolved Mercury by FIMS</b>								
<b>Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG035F)</b> MB_MW04, MK_MW06,	MK_MW08, ME_MW05	19-DEC-2013	---	16-JAN-2014	----	30-DEC-2013	16-JAN-2014	✓
<b>Clear Plastic Bottle - Filtered; Lab-acidified (EG035F)</b> MK_MW05,	MK_MW04	19-DEC-2013	---	16-JAN-2014	----	30-DEC-2013	16-JAN-2014	✓





Matrix: **WATER** Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EG051G: Ferrous Iron by Discrete Analyser</b>							
<b>Clear Plastic Bottle - HCl - Filtered (EG051G)</b> MK_MW05, MK_MW04, MB_MW04, MK_MW08, MK_MW06, ME_MW05	19-DEC-2013	----	----	----	24-DEC-2013	26-DEC-2013	✓
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS</b>							
<b>Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094A-F)</b> MB_MW04, MK_MW08, MK_MW06, ME_MW05	19-DEC-2013	---	17-JUN-2014	----	24-DEC-2013	17-JUN-2014	✓
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS</b>							
<b>Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094B-F)</b> MB_MW04, MK_MW08, MK_MW06, ME_MW05	19-DEC-2013	---	17-JUN-2014	----	24-DEC-2013	17-JUN-2014	✓
<b>EK040P: Fluoride by PC Titrator</b>							
<b>Clear Plastic Bottle - Natural (EK040P)</b> MK_MW05, MK_MW04, MB_MW04, MK_MW06, ME_MW05	19-DEC-2013	---	16-JAN-2014	----	21-DEC-2013	16-JAN-2014	✓
<b>EP066: Polychlorinated Biphenyls (PCB)</b>							
<b>Amber Glass Bottle - Unpreserved (EP066)</b> MK_MW05, MK_MW04, MK_MW06	19-DEC-2013	23-DEC-2013	26-DEC-2013	✓	02-JAN-2014	09-FEB-2014	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>							
<b>Amber Glass Bottle - Unpreserved (EP071)</b> MK_MW05, MK_MW04, MB_MW04, MK_MW06, ME_MW05	19-DEC-2013	23-DEC-2013	26-DEC-2013	✓	02-JAN-2014	09-FEB-2014	✓
<b>EP074D: Fumigants</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> MK_MW05, MK_MW04, MK_MW08, MK_MW06	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>EP074E: Halogenated Aliphatic Compounds</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> MK_MW05, MK_MW04, MK_MW08, MK_MW06	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>EP074F: Halogenated Aromatic Compounds</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> MK_MW05, MK_MW04, MK_MW08, MK_MW06	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MK_MW05, MK_MW08, MK_MW04, MK_MW06	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>EP074H: Naphthalene</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MK_MW05, MK_MW08, MK_MW04, MK_MW06	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>EP074B: Oxygenated Compounds</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MK_MW05, MK_MW08, MK_MW04, MK_MW06	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>EP074C: Sulfonated Compounds</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MK_MW05, MK_MW08, MK_MW04, MK_MW06	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>EP074G: Trihalomethanes</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MK_MW05, MK_MW08, MK_MW04, MK_MW06	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>EP075(SIM)A: Phenolic Compounds</b>							
Amber Glass Bottle - Unpreserved (EP075(SIM)) MK_MW05, MB_MW04, ME_MW05, MK_MW04, MK_MW06	19-DEC-2013	23-DEC-2013	26-DEC-2013	✓	02-JAN-2014	09-FEB-2014	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>							
Amber Glass Bottle - Unpreserved (EP075(SIM)) MK_MW05, MB_MW04, ME_MW05, MK_MW04, MK_MW06	19-DEC-2013	23-DEC-2013	26-DEC-2013	✓	02-JAN-2014	09-FEB-2014	✓
<b>EP080: BTEXN</b>							
Amber VOC Vial - Sulfuric Acid (EP080) MK_MW05, MK_MW08, MK_MW04, MK_MW06	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
Amber VOC Vial - Sulfuric Acid (EP080) MB_MW04, TS4, ME_MW05, TB3	19-DEC-2013	31-DEC-2013	02-JAN-2014	✓	31-DEC-2013	02-JAN-2014	✓

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 Work Order : ES1328001 Amendment 1  
 Client : ENVIRO RESOURCES MANAGEMENT  
 Project : SYMPHONY DELTA WEST



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MK_MW05, MK_MW08,	MK_MW04, MK_MW06	19-DEC-2013	28-DEC-2013	02-JAN-2014	✓	28-DEC-2013	02-JAN-2014	✓
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MB_MW04, TB3	ME_MW05,	19-DEC-2013	31-DEC-2013	02-JAN-2014	✓	31-DEC-2013	02-JAN-2014	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Alkalinity by PC Titrator	ED037-P	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	2	15	13.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	14	14.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	4	40	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
Alkalinity by PC Titrator	ED037-P	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	15	6.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	14	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	16	6.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	4	25.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
Chloride by Discrete Analyser	ED045G	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	15	6.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	14	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



Matrix: **WATER** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Method Blanks (MB) - Continued</b>							
Major Cations - Dissolved	ED093F	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	16	6.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	4	25.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
Chloride by Discrete Analyser	ED045G	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	15	6.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	14	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Sulfate (Turbidimetric) as SO <sub>4</sub> <sup>2-</sup> by Discrete Analyser	ED041G	WATER	APHA 21st ed., 4500-SO <sub>4</sub> Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> <sup>2-</sup> concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Chloride by Discrete Analyser	ED045G	WATER	APHA 21st ed., 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	Major Cations is determined based on APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um filtered sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Hardness parameters are calculated based on APHA 21st ed., 2340 B. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): Samples are 0.45 um filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) Samples are 0.45 um filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Ferrous Iron by Discrete Analyser	EG051G	WATER	APHA 21st ed., 3500 Fe-B. A colorimetric determination based on the reaction between phenanthroline and ferrous iron at pH 3.2-3.3 to form an orange-red complex that is measured against a five-point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)



Analytical Methods	Method	Matrix	Method Descriptions
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Fluoride by PC Titrator	EK040P	WATER	APHA 21st ed., 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by Turbi SO4 by DA. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Polychlorinated Biphenyls (PCB)	EP066	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
TPH - Semivolatle Fraction	EP071	WATER	USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Volatile Organic Compounds	EP074	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
TPH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Preparation Methods	Method	Matrix	Method Descriptions
Lab Acidification of Dissolved Metals	EN80F	WATER	US EPA Method 200.8
Separatory Funnel Extraction of Liquids	ORG14	WATER	USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.





## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Laboratory Control Spike (LCS) Recoveries</b>							
EP074E: Halogenated Aliphatic Compounds	3855103-002	----	Vinyl chloride	75-01-4	130 %	69.4-129%	Recovery greater than upper control limit
<b>Matrix Spike (MS) Recoveries</b>							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	ES1328001-001	MK_MW05	Sulfate as SO4 - Turbidimetric	14808-79-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG051G: Ferrous Iron by Discrete Analyser	ES1328000-004	Anonymous	Ferrous Iron	----	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG094F: Dissolved Metals in Fresh Water by ORC-ICP	ES1328000-001	Anonymous	Manganese	7439-96-5	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.

#### Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- No Analysis Holding Time Outliers exist.

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

**Work Order** : ES1328001

**Amendment** : 1

**Client** : ENVIRO RESOURCES MANAGEMENT  
**Laboratory** : Environmental Division Sydney

**Contact** : MR JONATHAN LEKAWSKI  
**Address** : GROUND FLOOR  
 33 SAUNDERS STREET, PYRMONT  
 NSW 2009  
 LOCKED BAG 24  
 BROADWAY NSW, AUSTRALIA 2007

**Contact** : Barbara Hanna  
**Address** : 277-289 Woodpark Road Smithfield  
 NSW Australia 2164

**E-mail** : jonathan.lekawski@erm.com  
**Telephone** : +61 02 8584 8888  
**Facsimile** : +61 02 8584 8800

**E-mail** : Barbara.Hanna@alsglobal.com  
**Telephone** : +61 2 8784 8555  
**Facsimile** : +61 2 8784 8555

**Project** : SYMPHONY DELTA WEST  
**Order number** : 0207420/0207423  
**C-O-C number** : ----  
**Site** : ----

**Page** : 1 of 3  
**Quote number** : ES2013ENVRES0360 (SY/551/13 V4)

**Sampler** : TS  
**QC Level** : NEPM 2013 Schedule B(3) and ALS QCS3 requirement

#### Dates

**Date Samples Received** : 20-DEC-2013  
**Client Requested Due Date** : 16-JAN-2014  
**Issue Date** : 16-JAN-2014  
**Scheduled Reporting Date** : **16-JAN-2014**

#### Delivery Details

**Mode of Delivery** : Carrier  
**No. of coolers/boxes** : 7 HARD  
**Security Seal** : Intact

**Temperature** : 2.5°C - Ice present  
**No. of samples received** : 8  
**No. of samples analysed** : 8

#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EG020F Dissolved Metals by ICPMS	WATER - EG035F Dissolved Mercury by FIMS	WATER - EG051G Ferrous Iron by Discrete Analyser	WATER - EG094A-F Dissolved Metals in Fresh Water Suite A by	WATER - EG094B-F Dissolved Metals in fresh water Suite B by	WATER - EK040-P Fluoride(PC)	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP066-PCB-WA Polychlorinated Biphenyls (PCB)
ES1328001-001	19-DEC-2013 09:41	MK_MW05	✓		✓			✓	✓	✓
ES1328001-002	19-DEC-2013 10:45	MK_MW04	✓		✓			✓	✓	✓
ES1328001-003	19-DEC-2013 12:00	MB_MW04		✓	✓	✓	✓	✓	✓	
ES1328001-004	19-DEC-2013 12:30	MK_MW08		✓	✓	✓	✓			
ES1328001-005	19-DEC-2013 13:00	MK_MW06		✓	✓	✓	✓	✓	✓	✓
ES1328001-006	19-DEC-2013 14:17	ME_MW05		✓	✓	✓	✓	✓	✓	

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EP074 (water) Volatile Organic Compounds	WATER - EP080 BTEXN	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)	WATER - W-02 8 Metals	WATER - W-18 TRH(C6 - C9)/BTEXN	WATER - W-24 TPH/BTEX/PAH/Phenols
ES1328001-001	19-DEC-2013 09:41	MK_MW05	✓		✓	✓	✓		✓
ES1328001-002	19-DEC-2013 10:45	MK_MW04	✓		✓	✓	✓		✓
ES1328001-003	19-DEC-2013 12:00	MB_MW04			✓	✓			✓
ES1328001-004	19-DEC-2013 12:30	MK_MW08	✓				✓		
ES1328001-005	19-DEC-2013 13:00	MK_MW06	✓		✓	✓			✓
ES1328001-006	19-DEC-2013 14:17	ME_MW05			✓	✓			✓
ES1328001-007	19-DEC-2013 13:00	TS4		✓					
ES1328001-008	19-DEC-2013 13:00	TB3					✓		

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
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Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )

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Email symphony.deltawest@erm.com

### SYMPHONY ERARING

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email Symphony.Eraring@erm.com  
Email Symphony.Eraring@erm.com  
Email Symphony.Eraring@erm.com  
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Email Symphony.Eraring@erm.com  
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Email Symphony.Eraring@erm.com  
Email Symphony.Eraring@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

# CHAIN OF CUSTODY

ALS Laboratory  
 4000 West 12th Street  
 Phoenix, AZ 85003  
 PH: 602.998.8888

CLIENT: **ERN**  
 OFFICE: **GROUND FLOOR, 33 SAUNDERS ST, PLYMOUTH NSW 2000**  
 PROJECT: **Symphony - Delta West**  
 ORDER NUMBER: **02074200209423**  
 PROJECT MANAGER: **Jennifer Lakowski**  
 CONTRACT PH: **8884 8888**

TURNAROUND REQUIREMENTS:  
 Standard TAT (last date date)  
 Urgent TAT (may be longer for some tests e.g. Uric Trace Organics)  
 ALS QUOTE NO: **SYN01/13 VA**

RELINQUISHED BY: **Therese Snow**  
 DATE/TIME: **19-12-13 / 15:45**

RECEIVED BY: **Sydney**  
 DATE/TIME: **20/12/13 09:30**

FOR LABORATORY USE ONLY (Client)  
 RECEIVED BY: \_\_\_\_\_  
 DATE/TIME: \_\_\_\_\_

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (codes below)	REFER TO	TOTAL CONTAINERS	W-4 (TPH/TRH) (CG-C36or 40) BTEXN	8 Ultra Trace Dissolved Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg) -	Additional Metals Ultra Trace - Se, Be, Ti, Mo	Ferrous Iron	PAH/Phenols	VOC Scan	PCB	Cations/Anions	Additional Information
1	MK-IMD05	19-12-13/14	Water	1 Amber, 2 vials Impurities, plastic, 1x ferrous 1 x ultra trace metals		6	X	X	X	X	X	X	X	X	
2	MK-IMD04	19-12-13/14	Water	1 Amber, 2 vials Impurities, plastic, 1x ferrous 1 x ultra trace metals		6	X	X	X	X	X	X	X	X	
3	MK-IMD04	19-12-13/14	Water	1 Amber, 2 vials Impurities, plastic, 1x ferrous 1 x ultra trace metals		6	X	X	X	X	X	X	X	X	
4	MK-IMD08	19-12-13/14	Water	1 Amber, 2 vials Impurities, plastic, 1x ferrous 1 x ultra trace metals		6	X	X	X	X	X	X	X	X	
5	MK-IMD06	19-12-13/14	Water	1 Amber, 2 vials Impurities, plastic, 1x ferrous 1 x ultra trace metals		6	X	X	X	X	X	X	X	X	
6	ME-IMD05	19-12-13/14	Water	1 Amber, 2 vials Impurities, plastic, 1x ferrous 1 x ultra trace metals		6	X	X	X	X	X	X	X	X	
7	TS 4	19-12-13/14	Water	1 Amber, 2 vials Impurities, plastic, 1x ferrous 1 x ultra trace metals		6	X	X	X	X	X	X	X	X	
8	TS 3	19-12-13/14	Water	1 Amber, 2 vials Impurities, plastic, 1x ferrous 1 x ultra trace metals		6	X	X	X	X	X	X	X	X	


COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ANALYSIS REQUIRED INCLUDING SUITES (NB: State Codes must be used to different sample sizes) which include are required, specify 'total' (unfiltered) or 'filtered' (field filtered) bottles (if needed).

Comments on any contaminant levels, methods, or samples requiring specific handling etc.

Vial sampled 18-12-13 please analyze as ~~fast~~ possible. many analy

Environmental Division  
 Sydney  
 Work Order  
**ES1328001**

Barcode:   
 Telephone: + 61-2-8784 8555

*Sydney*

## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>ES1328002</b> <b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : MR JONATHAN LEKAWSKI <b>Address</b> : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007  <b>E-mail</b> : jonathan.lekawski@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800 <b>Project</b> : SYMPHONY DELTA WEST <b>Order number</b> : 0207420/0207423 <b>C-O-C number</b> : ---- <b>Sampler</b> : TS <b>Site</b> : ----  <b>Quote number</b> : SY/551/13 V4	<b>Page</b> : 1 of 15  <b>Laboratory</b> : Environmental Division Sydney <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164  <b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555 <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement  <b>Date Samples Received</b> : 20-DEC-2013 <b>Issue Date</b> : 03-JAN-2014  <b>No. of samples received</b> : 9 <b>No. of samples analysed</b> : 9
--	--

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Organics
Raymond Commodor	Instrument Chemist	Sydney Inorganics
Sanjeshni Jyoti Mala	Senior Chemist Volatile	Sydney Organics



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## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EP074: Results for sample MK\_MW09 have been confirmed by re-analysis.**
- **EP080: Sample TRIP SPIKE contains volatile compounds spiked into the sample containers prior to dispatch from the laboratory. BTEX compounds spiked at 20 ug/L.**





## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MK_MW03	MK_MW02	ML_MW07	MK_MW11	MK_MW09
				18-DEC-2013 09:50	18-DEC-2013 10:48	18-DEC-2013 13:17	18-DEC-2013 14:21	18-DEC-2013 15:25
Compound	CAS Number	LOR	Unit	ES1328002-001	ES1328002-002	ES1328002-003	ES1328002-004	ES1328002-005
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	200	90	92	196	225
Total Alkalinity as CaCO3	----	1	mg/L	200	90	92	196	225
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	326	240	91	71	46
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	31	101	42	80	282
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	40	20	22	41	33
Magnesium	7439-95-4	1	mg/L	88	50	16	32	40
Sodium	7440-23-5	1	mg/L	29	55	50	44	135
Potassium	7440-09-7	1	mg/L	10	10	2	11	6
<b>EG035F: Dissolved Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
<b>EG051G: Ferrous Iron by Discrete Analyser</b>								
Ferrous Iron	----	0.05	mg/L	11.9	35.0	3.04	17.1	86.2
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS</b>								
Selenium	7782-49-2	0.2	µg/L	<0.2	<0.2	1.4	<0.2	1.3
Arsenic	7440-38-2	0.2	µg/L	2.8	3.0	3.1	39.7	8.6
Boron	7440-42-8	5	µg/L	29	21	17	22	18
Cadmium	7440-43-9	0.05	µg/L	0.08	0.23	0.52	0.07	0.06
Chromium	7440-47-3	0.2	µg/L	<0.2	0.2	<0.2	<0.2	0.8
Copper	7440-50-8	0.5	µg/L	<0.5	<0.5	4.7	1.3	1.6
Lead	7439-92-1	0.1	µg/L	0.5	2.3	0.5	<0.1	0.1
Manganese	7439-96-5	0.5	µg/L	18500	12600	3820	4460	4660
Nickel	7440-02-0	0.5	µg/L	277	346	36.0	184	134
Zinc	7440-66-6	1	µg/L	199	454	15	242	117
<b>EK040P: Fluoride by PC Titrator</b>								
Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.1	<0.1	<0.1
<b>EN055: Ionic Balance</b>								
Total Anions	----	0.01	meq/L	11.7	9.64	4.92	7.65	13.4
Total Cations	----	0.01	meq/L	10.8	9.63	4.74	7.39	13.0



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MK_MW03	MK_MW02	ML_MW07	MK_MW11	MK_MW09
				18-DEC-2013 09:50	18-DEC-2013 10:48	18-DEC-2013 13:17	18-DEC-2013 14:21	18-DEC-2013 15:25
Compound	CAS Number	LOR	Unit	ES1328002-001	ES1328002-002	ES1328002-003	ES1328002-004	ES1328002-005
<b>EN055: Ionic Balance - Continued</b>								
Ionic Balance	----	0.01	%	4.05	0.09	1.84	1.73	1.67
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	1	µg/L	<1	<1	<1	<1	<1
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	5	µg/L	<5	<5	<5	<5	<5
Isopropylbenzene	98-82-8	5	µg/L	<5	<5	<5	<5	<5
n-Propylbenzene	103-65-1	5	µg/L	<5	<5	<5	<5	<5
1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	<5	<5	<5
sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	<5	<5	<5
1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	<5	<5	<5
tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	<5	<5	<5
p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	<5	<5	8
n-Butylbenzene	104-51-8	5	µg/L	<5	<5	<5	<5	<5
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	50	µg/L	<50	<50	<50	<50	<50
2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	<50	<50	<50
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	<50	<50	<50
2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	<50	<50	<50
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	5	µg/L	<5	<5	<5	<5	<5
<b>EP074D: Fumigants</b>								
2.2-Dichloropropane	594-20-7	5	µg/L	<5	<5	<5	<5	<5
1.2-Dichloropropane	78-87-5	5	µg/L	<5	<5	<5	<5	<5
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	<5	<5	<5
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	<5	<5	<5
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	<5	<5	<5
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	<50	<50	<50
Chloromethane	74-87-3	50	µg/L	<50	<50	<50	<50	<50
Vinyl chloride	75-01-4	50	µg/L	<50	<50	<50	<50	<50
Bromomethane	74-83-9	50	µg/L	<50	<50	<50	<50	<50
Chloroethane	75-00-3	50	µg/L	<50	<50	<50	<50	<50
Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	<50	<50	<50



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MK_MW03	MK_MW02	ML_MW07	MK_MW11	MK_MW09
				18-DEC-2013 09:50	18-DEC-2013 10:48	18-DEC-2013 13:17	18-DEC-2013 14:21	18-DEC-2013 15:25
Compound	CAS Number	LOR	Unit	ES1328002-001	ES1328002-002	ES1328002-003	ES1328002-004	ES1328002-005
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	<5	<5	<5
Iodomethane	74-88-4	5	µg/L	<5	<5	<5	<5	<5
trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	<5	<5	<5
1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	<5	<5	<5
cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	<5	<5	<5
1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	<5	<5	<5
1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	<5	<5	<5
Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	<5	<5	<5
1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	<5	<5	<5
Trichloroethene	79-01-6	5	µg/L	<5	<5	<5	<5	<5
Dibromomethane	74-95-3	5	µg/L	<5	<5	<5	<5	<5
1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	<5	<5	<5
1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	<5	<5	<5
Tetrachloroethene	127-18-4	5	µg/L	<5	<5	<5	<5	<5
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	<5	<5	<5
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	<5	<5	<5
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	<5	<5	<5
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	<5	<5	<5
1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	<5	<5	<5
Pentachloroethane	76-01-7	5	µg/L	<5	<5	<5	<5	<5
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	<5	<5	<5
Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	<5	<5	<5
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	5	µg/L	<5	<5	<5	<5	<5
Bromobenzene	108-86-1	5	µg/L	<5	<5	<5	<5	<5
2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	<5	<5	<5
4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	<5	<5	<5
1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	<5	<5	<5
1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	<5	<5	<5
1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	<5	<5	<5
1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	<5	<5	<5
1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	<5	<5	<5
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	5	µg/L	<5	<5	<5	<5	<5



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MK_MW03	MK_MW02	ML_MW07	MK_MW11	MK_MW09
				18-DEC-2013 09:50	18-DEC-2013 10:48	18-DEC-2013 13:17	18-DEC-2013 14:21	18-DEC-2013 15:25
Compound	CAS Number	LOR	Unit	ES1328002-001	ES1328002-002	ES1328002-003	ES1328002-004	ES1328002-005
<b>EP074G: Trihalomethanes - Continued</b>								
Bromodichloromethane	75-27-4	5	µg/L	<5	<5	<5	<5	<5
Dibromochloromethane	124-48-1	5	µg/L	<5	<5	<5	<5	<5
Bromoform	75-25-2	5	µg/L	<5	<5	<5	<5	<5
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	7	µg/L	<7	<7	<7	<7	<7
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MK_MW03	MK_MW02	ML_MW07	MK_MW11	MK_MW09
				18-DEC-2013 09:50	18-DEC-2013 10:48	18-DEC-2013 13:17	18-DEC-2013 14:21	18-DEC-2013 15:25
Compound	CAS Number	LOR	Unit	ES1328002-001	ES1328002-002	ES1328002-003	ES1328002-004	ES1328002-005
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	90
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	90
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	<100	<100	100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	100
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	87.0	60.0	56.0	88.0	80.0
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	128	122	122	119	125
Toluene-D8	2037-26-5	0.1	%	94.3	93.9	92.2	85.6	92.0



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MK_MW03	MK_MW02	ML_MW07	MK_MW11	MK_MW09
				18-DEC-2013 09:50	18-DEC-2013 10:48	18-DEC-2013 13:17	18-DEC-2013 14:21	18-DEC-2013 15:25
Compound	CAS Number	LOR	Unit	ES1328002-001	ES1328002-002	ES1328002-003	ES1328002-004	ES1328002-005
<b>EP074S: VOC Surrogates - Continued</b>								
4-Bromofluorobenzene	460-00-4	0.1	%	112	114	110	102	111
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	18.5	17.6	14.6	22.3	19.6
2-Chlorophenol-D4	93951-73-6	0.1	%	40.1	28.7	26.3	53.7	40.0
2,4,6-Tribromophenol	118-79-6	0.1	%	49.4	42.1	40.6	67.0	70.6
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	56.6	45.1	39.4	81.4	63.3
Anthracene-d10	1719-06-8	0.1	%	67.5	50.1	37.0	84.9	69.9
4-Terphenyl-d14	1718-51-0	0.1	%	70.6	52.2	45.4	84.4	74.5
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	126	120	120	117	123
Toluene-D8	2037-26-5	0.1	%	116	117	115	106	114
4-Bromofluorobenzene	460-00-4	0.1	%	105	106	103	94.9	102



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MK_MW01	R01_181213-TS	TS3	TB2	----
				18-DEC-2013 16:22	18-DEC-2013 15:00	18-DEC-2013 15:00	18-DEC-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1328002-006	ES1328002-007	ES1328002-008	ES1328002-009	----
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	160	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	160	----	----	----	----
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	19	----	----	----	----
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	7	----	----	----	----
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	29	----	----	----	----
Magnesium	7439-95-4	1	mg/L	14	----	----	----	----
Sodium	7440-23-5	1	mg/L	19	----	----	----	----
Potassium	7440-09-7	1	mg/L	10	----	----	----	----
<b>EG035F: Dissolved Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	----	<0.0001	----	----	----
<b>EG051G: Ferrous Iron by Discrete Analyser</b>								
Ferrous Iron	----	0.05	mg/L	0.06	----	----	----	----
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS</b>								
Selenium	7782-49-2	0.2	µg/L	<0.2	----	----	----	----
Arsenic	7440-38-2	0.2	µg/L	0.5	----	----	----	----
Boron	7440-42-8	5	µg/L	18	----	----	----	----
Cadmium	7440-43-9	0.05	µg/L	0.52	----	----	----	----
Chromium	7440-47-3	0.2	µg/L	<0.2	----	----	----	----
Copper	7440-50-8	0.5	µg/L	1.2	----	----	----	----
Lead	7439-92-1	0.1	µg/L	<0.1	----	----	----	----
Manganese	7439-96-5	0.5	µg/L	786	----	----	----	----
Nickel	7440-02-0	0.5	µg/L	42.8	----	----	----	----
Zinc	7440-66-6	1	µg/L	37	----	----	----	----
<b>EG094T: Total metals in Fresh water by ORC-ICPMS</b>								
Selenium	7782-49-2	0.2	µg/L	----	<0.2	----	----	----
Arsenic	7440-38-2	0.2	µg/L	----	<0.2	----	----	----





## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MK_MW01	R01_181213-TS	TS3	TB2	----
				18-DEC-2013 16:22	18-DEC-2013 15:00	18-DEC-2013 15:00	18-DEC-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1328002-006	ES1328002-007	ES1328002-008	ES1328002-009	----
<b>EG094T: Total metals in Fresh water by ORC-ICPMS - Continued</b>								
Boron	7440-42-8	5	µg/L	----	<5	----	----	----
Cadmium	7440-43-9	0.05	µg/L	----	<0.05	----	----	----
Chromium	7440-47-3	0.2	µg/L	----	<0.2	----	----	----
Copper	7440-50-8	0.5	µg/L	----	<0.5	----	----	----
Lead	7439-92-1	0.1	µg/L	----	<0.1	----	----	----
Manganese	7439-96-5	0.5	µg/L	----	<0.5	----	----	----
Nickel	7440-02-0	0.5	µg/L	----	<0.5	----	----	----
Zinc	7440-66-6	1	µg/L	----	<1	----	----	----
<b>EK040P: Fluoride by PC Titrator</b>								
Fluoride	16984-48-8	0.1	mg/L	<b>0.2</b>	----	----	----	----
<b>EN055: Ionic Balance</b>								
Total Anions	----	0.01	meq/L	<b>3.79</b>	----	----	----	----
Total Cations	----	0.01	meq/L	<b>3.68</b>	----	----	----	----
Ionic Balance	----	0.01	%	<b>1.49</b>	----	----	----	----
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	1	µg/L	<1	----	----	----	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	5	µg/L	<5	----	----	----	----
Isopropylbenzene	98-82-8	5	µg/L	<5	----	----	----	----
n-Propylbenzene	103-65-1	5	µg/L	<5	----	----	----	----
1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	----	----	----	----
sec-Butylbenzene	135-98-8	5	µg/L	<5	----	----	----	----
1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	----	----	----	----
tert-Butylbenzene	98-06-6	5	µg/L	<5	----	----	----	----
p-Isopropyltoluene	99-87-6	5	µg/L	<5	----	----	----	----
n-Butylbenzene	104-51-8	5	µg/L	<5	----	----	----	----
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	50	µg/L	<50	----	----	----	----
2-Butanone (MEK)	78-93-3	50	µg/L	<50	----	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	----	----	----	----
2-Hexanone (MBK)	591-78-6	50	µg/L	<50	----	----	----	----
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	5	µg/L	<5	----	----	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MK_MW01	R01_181213-TS	TS3	TB2	----
				18-DEC-2013 16:22	18-DEC-2013 15:00	18-DEC-2013 15:00	18-DEC-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1328002-006	ES1328002-007	ES1328002-008	ES1328002-009	----
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	5	µg/L	<5	----	----	----	----
1,2-Dichloropropane	78-87-5	5	µg/L	<5	----	----	----	----
cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	----	----	----	----
trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	----	----	----	----
1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	----	----	----	----
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	50	µg/L	<50	----	----	----	----
Chloromethane	74-87-3	50	µg/L	<50	----	----	----	----
Vinyl chloride	75-01-4	50	µg/L	<50	----	----	----	----
Bromomethane	74-83-9	50	µg/L	<50	----	----	----	----
Chloroethane	75-00-3	50	µg/L	<50	----	----	----	----
Trichlorofluoromethane	75-69-4	50	µg/L	<50	----	----	----	----
1,1-Dichloroethene	75-35-4	5	µg/L	<5	----	----	----	----
Iodomethane	74-88-4	5	µg/L	<5	----	----	----	----
trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	----	----	----	----
1,1-Dichloroethane	75-34-3	5	µg/L	<5	----	----	----	----
cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	----	----	----	----
1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	----	----	----	----
1,1-Dichloropropylene	563-58-6	5	µg/L	<5	----	----	----	----
Carbon Tetrachloride	56-23-5	5	µg/L	<5	----	----	----	----
1,2-Dichloroethane	107-06-2	5	µg/L	<5	----	----	----	----
Trichloroethene	79-01-6	5	µg/L	<5	----	----	----	----
Dibromomethane	74-95-3	5	µg/L	<5	----	----	----	----
1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	----	----	----	----
1,3-Dichloropropane	142-28-9	5	µg/L	<5	----	----	----	----
Tetrachloroethene	127-18-4	5	µg/L	<5	----	----	----	----
1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	----	----	----	----
trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	----	----	----	----
cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	----	----	----	----
1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	----	----	----	----
1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	----	----	----	----
Pentachloroethane	76-01-7	5	µg/L	<5	----	----	----	----
1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	----	----	----	----
Hexachlorobutadiene	87-68-3	5	µg/L	<5	----	----	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MK_MW01	R01_181213-TS	TS3	TB2	----
				18-DEC-2013 16:22	18-DEC-2013 15:00	18-DEC-2013 15:00	18-DEC-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1328002-006	ES1328002-007	ES1328002-008	ES1328002-009	----
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	5	µg/L	<5	----	----	----	----
Bromobenzene	108-86-1	5	µg/L	<5	----	----	----	----
2-Chlorotoluene	95-49-8	5	µg/L	<5	----	----	----	----
4-Chlorotoluene	106-43-4	5	µg/L	<5	----	----	----	----
1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	----	----	----	----
1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	----	----	----	----
1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	----	----	----	----
1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	----	----	----	----
1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	----	----	----	----
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	5	µg/L	<5	----	----	----	----
Bromodichloromethane	75-27-4	5	µg/L	<5	----	----	----	----
Dibromochloromethane	124-48-1	5	µg/L	<5	----	----	----	----
Bromoform	75-25-2	5	µg/L	<5	----	----	----	----
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	7	µg/L	<7	----	----	----	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	1.0	µg/L	<1.0	----	----	----	----
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	----	----	----	----
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	----	----	----	----
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	----	----	----	----
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	----	----	----	----
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	----	----	----	----
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	----	----	----	----
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	----	----	----	----
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	----	----	----	----
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	----	----	----	----
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	----	----	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	1.0	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	----	----	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MK_MW01	R01_181213-TS	TS3	TB2	----
				18-DEC-2013 16:22	18-DEC-2013 15:00	18-DEC-2013 15:00	18-DEC-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1328002-006	ES1328002-007	ES1328002-008	ES1328002-009	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Acenaphthene	83-32-9	1.0	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	----	----	----	----
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	----	----	----	----
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	----	----	----	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	20	µg/L	<20	<20	----	<20	----
C10 - C14 Fraction	----	50	µg/L	<50	<50	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	----	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	----	<20	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	----	<20	----
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	<100	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	----	----	----
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	<1	<1	17	<1	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MK_MW01	R01_181213-TS	TS3	TB2	----
				18-DEC-2013 16:22	18-DEC-2013 15:00	18-DEC-2013 15:00	18-DEC-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1328002-006	ES1328002-007	ES1328002-008	ES1328002-009	----
<b>EP080: BTEXN - Continued</b>								
Toluene	108-88-3	2	µg/L	<2	<2	17	<2	----
Ethylbenzene	100-41-4	2	µg/L	<2	<2	16	<2	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	16	<2	----
ortho-Xylene	95-47-6	2	µg/L	<2	<2	16	<2	----
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	32	<2	----
^ Sum of BTEX	----	1	µg/L	<1	<1	82	<1	----
Naphthalene	91-20-3	5	µg/L	<5	<5	19	<5	----
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	85.0	----	----	----	----
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	118	----	----	----	----
Toluene-D8	2037-26-5	0.1	%	119	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	103	----	----	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	23.0	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	48.8	----	----	----	----
2,4,6-Tribromophenol	118-79-6	0.1	%	66.7	----	----	----	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	73.9	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%	80.6	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	84.6	----	----	----	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	116	101	110	91.8	----
Toluene-D8	2037-26-5	0.1	%	104	105	115	94.6	----
4-Bromofluorobenzene	460-00-4	0.1	%	96.1	96.8	110	86.1	----



## Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP066S: PCB Surrogate</b>			
Decachlorobiphenyl	2051-24-3	28.5	129
<b>EP074S: VOC Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	78.3	133.2
Toluene-D8	2037-26-5	79.1	128.9
4-Bromofluorobenzene	460-00-4	80.8	123.7
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	10.0	44
2-Chlorophenol-D4	93951-73-6	14	94
2,4,6-Tribromophenol	118-79-6	17	125
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27.4	113
4-Terphenyl-d14	1718-51-0	32	112
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

## QUALITY CONTROL REPORT

<b>Work Order</b>	: <b>ES1328002</b>	Page	: 1 of 23
<b>Client</b>	: <b>ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: MR JONATHAN LEKAWSKI	<b>Contact</b>	: Barbara Hanna
<b>Address</b>	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
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<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: SYMPHONY DELTA WEST	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b>	: ----	<b>Date Samples Received</b>	: 20-DEC-2013
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: 03-JAN-2014
<b>Sampler</b>	: TS	<b>No. of samples received</b>	: 9
<b>Order number</b>	: 0207420/0207423	<b>No. of samples analysed</b>	: 9
<b>Quote number</b>	: SY/551/13 V4		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Organics
Raymond Commodor	Instrument Chemist	Sydney Inorganics
Sanjeshni Jyoti Mala	Senior Chemist Volatile	Sydney Organics





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### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :

- Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
- CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
- LOR = Limit of reporting
- RPD = Relative Percentage Difference
- # = Indicates failed QC



### Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>ED037P: Alkalinity by PC Titrator (QC Lot: 3225582)</b>									
ES1328000-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	356	354	0.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	356	354	0.5	0% - 20%
ES1328002-004	MK_MW11	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	196	196	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	196	196	0.0	0% - 20%
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3225535)</b>									
ES1328001-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	157	156	0.0	0% - 20%
ES1328002-005	MK_MW09	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	46	44	3.6	0% - 20%
<b>ED045G: Chloride Discrete analyser (QC Lot: 3225534)</b>									
ES1328001-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	50	51	0.0	0% - 20%
ES1328002-005	MK_MW09	ED045G: Chloride	16887-00-6	1	mg/L	282	281	0.0	0% - 20%
<b>ED093F: Dissolved Major Cations (QC Lot: 3225533)</b>									
ES1328001-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	40	40	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	20	20	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	44	44	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	13	13	0.0	0% - 50%
ES1328109-046	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	2	2	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	2	2	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	45	46	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	6	6	0.0	No Limit
<b>EG035F: Dissolved Mercury by FIMS (QC Lot: 3230341)</b>									
ES1328002-001	MK_MW03	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3227571)</b>									
ES1328002-007	R01_181213-TS	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1328109-046	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
<b>EG051G: Ferrous Iron by Discrete Analyser (QC Lot: 3229115)</b>									
ES1328000-004	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	16.7	16.7	0.06	0% - 20%
ES1328002-003	ML_MW07	EG051G: Ferrous Iron	----	0.05	mg/L	3.04	3.03	0.4	0% - 20%
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 3228353)</b>									
ES1327851-001	Anonymous	EG094A-F: Cadmium	7440-43-9	0.05	µg/L	0.10	0.10	0.0	No Limit
		EG094A-F: Lead	7439-92-1	0.1	µg/L	1.0	0.9	0.0	No Limit
		EG094A-F: Arsenic	7440-38-2	0.2	µg/L	0.2	<0.2	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 3228353) - continued</b>									
ES1327851-001	Anonymous	EG094A-F: Chromium	7440-47-3	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG094A-F: Copper	7440-50-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG094A-F: Manganese	7439-96-5	0.5	µg/L	1750	1700	2.7	0% - 20%
		EG094A-F: Nickel	7440-02-0	0.5	µg/L	126	123	2.5	0% - 20%
		EG094A-F: Zinc	7440-66-6	1	µg/L	434	425	2.2	0% - 20%
		EG094A-F: Boron	7440-42-8	5	µg/L	45	44	0.0	No Limit
ES1328000-002	Anonymous	EG094A-F: Cadmium	7440-43-9	0.05	µg/L	0.13	0.12	0.0	No Limit
		EG094A-F: Lead	7439-92-1	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG094A-F: Arsenic	7440-38-2	0.2	µg/L	1.6	1.7	0.0	No Limit
		EG094A-F: Chromium	7440-47-3	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG094A-F: Copper	7440-50-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG094A-F: Manganese	7439-96-5	0.5	µg/L	9090	8990	1.1	0% - 20%
		EG094A-F: Nickel	7440-02-0	0.5	µg/L	80.5	81.0	0.6	0% - 20%
		EG094A-F: Zinc	7440-66-6	1	µg/L	18	18	0.0	0% - 50%
EG094A-F: Boron	7440-42-8	5	µg/L	18	18	0.0	No Limit		
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 3228354)</b>									
ES1327851-001	Anonymous	EG094B-F: Selenium	7782-49-2	0.2	µg/L	0.3	<0.2	50.2	No Limit
ES1328000-002	Anonymous	EG094B-F: Selenium	7782-49-2	0.2	µg/L	<0.2	<0.2	0.0	No Limit
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 3228355)</b>									
ES1328002-005	MK_MW09	EG094A-F: Cadmium	7440-43-9	0.05	µg/L	0.06	<0.05	0.0	No Limit
		EG094A-F: Lead	7439-92-1	0.1	µg/L	0.1	0.1	0.0	No Limit
		EG094A-F: Arsenic	7440-38-2	0.2	µg/L	8.6	8.7	1.4	0% - 20%
		EG094A-F: Chromium	7440-47-3	0.2	µg/L	0.8	0.7	0.0	No Limit
		EG094A-F: Copper	7440-50-8	0.5	µg/L	1.6	1.5	0.0	No Limit
		EG094A-F: Manganese	7439-96-5	0.5	µg/L	4660	4510	3.2	0% - 20%
		EG094A-F: Nickel	7440-02-0	0.5	µg/L	134	133	1.0	0% - 20%
		EG094A-F: Zinc	7440-66-6	1	µg/L	117	115	1.6	0% - 20%
EG094A-F: Boron	7440-42-8	5	µg/L	18	18	0.0	No Limit		
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 3228356)</b>									
ES1328002-005	MK_MW09	EG094B-F: Selenium	7782-49-2	0.2	µg/L	1.3	1.3	0.0	No Limit
<b>EG094T: Total metals in Fresh water by ORC-ICPMS (QC Lot: 3232157)</b>									
ES1327627-001	Anonymous	EG094A-T: Cadmium	7440-43-9	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EG094A-T: Lead	7439-92-1	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG094A-T: Arsenic	7440-38-2	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG094A-T: Chromium	7440-47-3	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG094A-T: Copper	7440-50-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG094A-T: Manganese	7439-96-5	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG094A-T: Nickel	7440-02-0	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG094A-T: Zinc	7440-66-6	1	µg/L	<1	<1	0.0	No Limit
EG094A-T: Boron	7440-42-8	5	µg/L	<5	<5	0.0	No Limit		



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG094T: Total metals in Fresh water by ORC-ICPMS (QC Lot: 3232158)</b>									
ES1327627-001	Anonymous	EG094B-T: Selenium	7782-49-2	0.2	µg/L	<0.2	<0.2	0.0	No Limit
<b>EK040P: Fluoride by PC Titrator (QC Lot: 3225581)</b>									
ES1327989-002	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
ES1328000-002	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.0	No Limit
<b>EK040P: Fluoride by PC Titrator (QC Lot: 3225583)</b>									
ES1328002-004	MK_MW11	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
ES1328012-001	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
<b>EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 3227667)</b>									
ES1328000-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	1	µg/L	<1	<1	0.0	No Limit
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3229797)</b>									
ES1327989-001	Anonymous	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
ES1328001-001	Anonymous	EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
ES1327989-001	Anonymous	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
ES1328001-001	Anonymous	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
<b>EP074C: Sulfonated Compounds (QC Lot: 3229797)</b>									
ES1327989-001	Anonymous	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074C: Sulfonated Compounds (QC Lot: 3229797) - continued</b>									
ES1328001-001	Anonymous	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
<b>EP074D: Fumigants (QC Lot: 3229797)</b>									
ES1327989-001	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
ES1328001-001	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3229797)</b>									
ES1327989-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit		
EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit		



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3229797) - continued</b>									
ES1327989-001	Anonymous	EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit
ES1328001-001	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit		
EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit		
EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit		
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit		
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3229797)</b>									
ES1327989-001	Anonymous	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
ES1328001-001	Anonymous	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3229797) - continued</b>									
ES1328001-001	Anonymous	EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
<b>EP074G: Trihalomethanes (QC Lot: 3229797)</b>									
ES1327989-001	Anonymous	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
ES1328001-001	Anonymous	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
<b>EP074H: Naphthalene (QC Lot: 3229797)</b>									
ES1327989-001	Anonymous	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit
ES1328001-001	Anonymous	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3227669)</b>									
ES1328000-001	Anonymous	EP075(SIM): Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	0.0	No Limit
		ES1328000-004	Anonymous	EP075(SIM): Phenol	108-95-2	1.0	µg/L	<1.0	<1.0
EP075(SIM): 2-Chlorophenol	95-57-8			1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): 2-Methylphenol	95-48-7			1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): 2-Nitrophenol	88-75-5			1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): 2.4-Dimethylphenol	105-67-9			1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): 2.4-Dichlorophenol	120-83-2			1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): 2.6-Dichlorophenol	87-65-0			1.0	µg/L	<1.0	<1.0	0.0	No Limit





Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3227669) - continued</b>									
ES1328000-004	Anonymous	EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	0.0	No Limit
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3227669)</b>									
ES1328000-001	Anonymous	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit		
ES1328000-004	Anonymous	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit		
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3227668)</b>									
ES1328000-001	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3227668) - continued</b>										
ES1328000-001	Anonymous	EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit	
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit	
ES1328000-004	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.0	No Limit	
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit	
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3229798)</b>										
ES1327989-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit	
ES1328001-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3229802)</b>										
ES1327901-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit	
ES1328000-002	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3227668)</b>										
ES1328000-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	0.0	No Limit	
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit	
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit	
ES1328000-004	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	0.0	No Limit	
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit	
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3229798)</b>										
ES1327989-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit	
ES1328001-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3229802)</b>										
ES1327901-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit	
ES1328000-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit	
<b>EP080: BTEXN (QC Lot: 3229798)</b>										
ES1327989-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit	
ES1328001-001	Anonymous	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit	
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit	
			106-42-3							
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit			
EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit			



Sub-Matrix: <b>WATER</b>				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP080: BTEXN (QC Lot: 3229802)</b>									
ES1327901-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES1328000-002	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit



### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>ED037P: Alkalinity by PC Titrator (QCLot: 3225582)</b>									
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	----	200 mg/L	95.2	81	111	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3225535)</b>									
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	105	86	122	
<b>ED045G: Chloride Discrete analyser (QCLot: 3225534)</b>									
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	109	77	123	
<b>ED093F: Dissolved Major Cations (QCLot: 3225533)</b>									
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	87	113	
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.2	89	113	
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.3	79	113	
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	101	87	115	
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3230341)</b>									
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	94.9	78	114	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3227571)</b>									
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	109	77	115	
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3229115)</b>									
EG051G: Ferrous Iron	----	0.10	mg/L	<0.10	2.00 mg/L	109	89	113	
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3228353)</b>									
EG094A-F: Arsenic	7440-38-2	0.2	µg/L	<0.2	10 µg/L	92.3	75	129	
EG094A-F: Boron	7440-42-8	5	µg/L	<5	10 µg/L	121	79	129	
EG094A-F: Cadmium	7440-43-9	0.05	µg/L	<0.05	10 µg/L	99.6	78	112	
EG094A-F: Chromium	7440-47-3	0.2	µg/L	<0.2	10 µg/L	98.1	71	123	
EG094A-F: Copper	7440-50-8	0.5	µg/L	<0.5	10 µg/L	101	77	125	
EG094A-F: Lead	7439-92-1	0.1	µg/L	<0.1	10 µg/L	89.2	74	118	
EG094A-F: Manganese	7439-96-5	0.5	µg/L	<0.5	10 µg/L	95.1	79	119	
EG094A-F: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	109	72	128	
EG094A-F: Zinc	7440-66-6	1	µg/L	<1	10 µg/L	109	76	134	
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3228354)</b>									
EG094B-F: Selenium	7782-49-2	0.2	µg/L	<0.2	10 µg/L	106	75	125	
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3228355)</b>									
EG094A-F: Arsenic	7440-38-2	0.2	µg/L	<0.2	10 µg/L	89.4	75	129	
EG094A-F: Boron	7440-42-8	5	µg/L	<5	10 µg/L	103	79	129	
EG094A-F: Cadmium	7440-43-9	0.05	µg/L	<0.05	10 µg/L	98.0	78	112	
EG094A-F: Chromium	7440-47-3	0.2	µg/L	<0.2	10 µg/L	103	71	123	



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3228355) - continued</b>									
EG094A-F: Copper	7440-50-8	0.5	µg/L	<0.5	10 µg/L	99.2	77	125	
EG094A-F: Lead	7439-92-1	0.1	µg/L	<0.1	10 µg/L	90.5	74	118	
EG094A-F: Manganese	7439-96-5	0.5	µg/L	<0.5	10 µg/L	103	79	119	
EG094A-F: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	107	72	128	
EG094A-F: Zinc	7440-66-6	1	µg/L	<1	10 µg/L	105	76	134	
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3228356)</b>									
EG094B-F: Selenium	7782-49-2	0.2	µg/L	<0.2	10 µg/L	91.6	75	125	
<b>EG094T: Total metals in Fresh water by ORC-ICPMS (QCLot: 3232157)</b>									
EG094A-T: Arsenic	7440-38-2	0.2	µg/L	<0.2	10 µg/L	103	81	125	
EG094A-T: Boron	7440-42-8	5	µg/L	<5	10 µg/L	97.6	70	130	
EG094A-T: Cadmium	7440-43-9	0.05	µg/L	<0.05	10 µg/L	98.8	77	111	
EG094A-T: Chromium	7440-47-3	0.2	µg/L	<0.2	10 µg/L	104	78	126	
EG094A-T: Copper	7440-50-8	0.5	µg/L	<0.5	10 µg/L	98.9	78	126	
EG094A-T: Lead	7439-92-1	0.1	µg/L	<0.1	10 µg/L	103	75	123	
EG094A-T: Manganese	7439-96-5	0.5	µg/L	<0.5	10 µg/L	103	81	121	
EG094A-T: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	106	82	124	
EG094A-T: Zinc	7440-66-6	1	µg/L	<1	10 µg/L	101	75	129	
<b>EG094T: Total metals in Fresh water by ORC-ICPMS (QCLot: 3232158)</b>									
EG094B-T: Selenium	7782-49-2	0.2	µg/L	<0.2	10 µg/L	94.6	78	124	
<b>EK040P: Fluoride by PC Titrator (QCLot: 3225581)</b>									
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5.0 mg/L	94.8	75	119	
<b>EK040P: Fluoride by PC Titrator (QCLot: 3225583)</b>									
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5.0 mg/L	95.6	75	119	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3227667)</b>									
EP066: Total Polychlorinated biphenyls	----	1	µg/L	<1	10 µg/L	103	61.6	107	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3229797)</b>									
EP074: Styrene	100-42-5	5	µg/L	<5	10 µg/L	104	74	118	
EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	10 µg/L	108	75	121	
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	10 µg/L	111	67	123	
EP074: 1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	10 µg/L	107	70	122	
EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	10 µg/L	111	69	123	
EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	10 µg/L	109	71	121	
EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	10 µg/L	110	70	122	
EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	10 µg/L	109	67	123	
EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	10 µg/L	110	62	126	
<b>EP074B: Oxygenated Compounds (QCLot: 3229797)</b>									
EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	100 µg/L	104	61.4	134	
EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	100 µg/L	105	73.6	130	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074B: Oxygenated Compounds (QCLot: 3229797) - continued</b>									
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	100 µg/L	104	61	139	
EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	100 µg/L	104	65	137	
<b>EP074C: Sulfonated Compounds (QCLot: 3229797)</b>									
EP074: Carbon disulfide	75-15-0	5	µg/L	<5	10 µg/L	97.2	72.8	127	
<b>EP074D: Fumigants (QCLot: 3229797)</b>									
EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	10 µg/L	103	61	119	
EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	10 µg/L	110	76	120	
EP074: cis-1,3-Dichloropropylene	10061-01-5	10	µg/L	<10	10 µg/L	91.7	62	120	
EP074: trans-1,3-Dichloropropylene	10061-02-6	10	µg/L	<10	10 µg/L	94.7	61	119	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	10 µg/L	105	69	117	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3229797)</b>									
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	100 µg/L	114	60.6	138	
EP074: Chloromethane	74-87-3	50	µg/L	<50	100 µg/L	118	67.4	130	
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	100 µg/L	# 130	69.4	129	
EP074: Bromomethane	74-83-9	50	µg/L	<50	100 µg/L	116	56	140	
EP074: Chloroethane	75-00-3	50	µg/L	<50	100 µg/L	123	63	135	
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	100 µg/L	119	65	131	
EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	10 µg/L	104	69	123	
EP074: Iodomethane	74-88-4	5	µg/L	<5	10 µg/L	102	70.2	128	
EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	10 µg/L	109	71	119	
EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	10 µg/L	112	75	119	
EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	10 µg/L	111	77	117	
EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	10 µg/L	103	61	119	
EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	10 µg/L	109	73	119	
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	10 µg/L	98.5	63	121	
EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	10 µg/L	118	78	122	
EP074: Trichloroethene	79-01-6	5	µg/L	<5	10 µg/L	107	74	120	
EP074: Dibromomethane	74-95-3	5	µg/L	<5	10 µg/L	105	74	118	
EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	10 µg/L	110	75	123	
EP074: 1,3-Dichloropropane	142-28-9	5	µg/L	<5	10 µg/L	107	79	121	
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	10 µg/L	108	72	124	
EP074: 1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	10 µg/L	95.5	66	114	
EP074: trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	10 µg/L	101	60	120	
EP074: cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	10 µg/L	95.2	70.6	128	
EP074: 1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	10 µg/L	103	70	124	
EP074: 1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	10 µg/L	113	74	128	
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	10 µg/L	87.4	71.8	126	
EP074: 1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	10 µg/L	86.1	66.4	136	
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	10 µg/L	117	58	132	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3229797)</b>									
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	10 µg/L	116	80	118	
EP074: Bromobenzene	108-86-1	5	µg/L	<5	10 µg/L	105	76	116	
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	10 µg/L	115	71	121	
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	10 µg/L	111	71	121	
EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	10 µg/L	112	74	120	
EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	10 µg/L	115	72	120	
EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	10 µg/L	110	77	117	
EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	10 µg/L	112	60	126	
EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	10 µg/L	118	67	125	
<b>EP074G: Trihalomethanes (QCLot: 3229797)</b>									
EP074: Chloroform	67-66-3	5	µg/L	<5	10 µg/L	113	76	118	
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	10 µg/L	100	64	118	
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	10 µg/L	95.3	65	115	
EP074: Bromoform	75-25-2	5	µg/L	<5	10 µg/L	90.9	73.5	126	
<b>EP074H: Naphthalene (QCLot: 3229797)</b>									
EP074: Naphthalene	91-20-3	7	µg/L	<7	10 µg/L	92.6	61	125	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3227669)</b>									
EP075(SIM): Phenol	108-95-2	0.2	µg/L	----	5 µg/L	36.6	24.5	61.9	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Chlorophenol	95-57-8	0.2	µg/L	----	5 µg/L	64.6	63.8	110	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Methylphenol	95-48-7	0.2	µg/L	----	5 µg/L	66.4	55.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	0.4	µg/L	----	10 µg/L	60.3	42.5	114	
		2	µg/L	<2.0	----	----	----	----	
EP075(SIM): 2-Nitrophenol	88-75-5	0.2	µg/L	----	5 µg/L	71.9	62.7	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.2	µg/L	----	5 µg/L	66.4	59.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.2	µg/L	----	5 µg/L	85.5	59.3	122	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.2	µg/L	----	5 µg/L	76.0	64.3	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.2	µg/L	----	5 µg/L	67.8	63	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.2	µg/L	----	5 µg/L	81.4	58.7	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.2	µg/L	----	5 µg/L	81.8	50	108	
		1	µg/L	<1.0	----	----	----	----	





Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
					LCS	Low	High	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3227669) - continued</b>								
EP075(SIM): Pentachlorophenol	87-86-5	0.4	µg/L	----	10 µg/L	# 99.8	8.7	95
		2	µg/L	<2.0	----	----	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3227669)</b>								
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	5 µg/L	70.8	58.6	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	5 µg/L	77.1	63.6	114
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	5 µg/L	73.5	62.2	113
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	5 µg/L	78.4	63.9	115
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	5 µg/L	94.8	62.6	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	5 µg/L	94.7	64.3	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	5 µg/L	106	63.6	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	5 µg/L	103	63.1	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	5 µg/L	98.6	64.1	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	5 µg/L	103	62.5	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	5 µg/L	95.1	61.7	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	5 µg/L	104	61.7	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	5 µg/L	89.0	63.3	117
		0.5	µg/L	<0.5	----	----	----	----
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	5 µg/L	87.9	59.9	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	----	5 µg/L	84.5	61.2	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	----	5 µg/L	95.5	59.1	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	1	µg/L	<1.0	----	----	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3227668)</b>								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	86.6	59	129
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	106	71	131
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	83.8	62	120



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	High
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229798)</b>									
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	126	75	127	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229802)</b>									
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	103	75	127	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3227668)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	2500 µg/L	97.8	58.9	131	
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	104	73.9	138	
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----	
		50	µg/L	----	1500 µg/L	86.2	67	127	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229798)</b>									
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	127	75	127	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229802)</b>									
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	104	75	127	
<b>EP080: BTEXN (QCLot: 3229798)</b>									
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	123	70	124	
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	118	65	129	
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	112	70	120	
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	111	69	121	
	106-42-3								
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	112	72	122	
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	109	70	124	
<b>EP080: BTEXN (QCLot: 3229802)</b>									
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	112	70	124	
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	102	65	129	
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	99.2	70	120	
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	101	69	121	
	106-42-3								
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	104	72	122	
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	108	70	124	

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report				
				Spike Concentration	Spike Recovery(%)		Recovery Limits (%)	
					MS	Low	High	High
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3225535)</b>								
ES1328001-001	Anonymous							



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3225535) - continued</b>							
ES1328001-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130
<b>ED045G: Chloride Discrete analyser (QCLot: 3225534)</b>							
ES1328001-001	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	98.2	70	130
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3230341)</b>							
ES1328002-001	MK_MW03	EG035F: Mercury	7439-97-6	0.0100 mg/L	81.6	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3227571)</b>							
ES1328003-007	Anonymous	EG035T: Mercury	7439-97-6	0.010 mg/L	81.6	70	130
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3229115)</b>							
ES1328000-004	Anonymous	EG051G: Ferrous Iron	----	1.00 mg/L	# Not Determined	68	128
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3228353)</b>							
ES1328000-001	Anonymous	EG094A-F: Arsenic	7440-38-2	50 µg/L	124	70	130
		EG094A-F: Cadmium	7440-43-9	12.5 µg/L	105	70	130
		EG094A-F: Chromium	7440-47-3	50 µg/L	107	70	130
		EG094A-F: Copper	7440-50-8	50 µg/L	103	70	130
		EG094A-F: Lead	7439-92-1	50 µg/L	94.2	70	130
		EG094A-F: Manganese	7439-96-5	50 µg/L	# Not Determined	70	130
		EG094A-F: Nickel	7440-02-0	50 µg/L	112	70	130
		EG094A-F: Zinc	7440-66-6	50 µg/L	113	70	130
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3228355)</b>							
ES1328002-006	MK_MW01	EG094A-F: Arsenic	7440-38-2	50 µg/L	117	70	130
		EG094A-F: Cadmium	7440-43-9	12.5 µg/L	109	70	130
		EG094A-F: Chromium	7440-47-3	50 µg/L	110	70	130
		EG094A-F: Copper	7440-50-8	50 µg/L	105	70	130
		EG094A-F: Lead	7439-92-1	50 µg/L	101	70	130
		EG094A-F: Manganese	7439-96-5	50 µg/L	# Not Determined	70	130
		EG094A-F: Nickel	7440-02-0	50 µg/L	111	70	130
		EG094A-F: Zinc	7440-66-6	50 µg/L	115	70	130
<b>EG094T: Total metals in Fresh water by ORC-ICPMS (QCLot: 3232157)</b>							
ES1327627-004	Anonymous	EG094A-T: Arsenic	7440-38-2	50 µg/L	126	70	130
		EG094A-T: Cadmium	7440-43-9	12.5 µg/L	111	70	130
		EG094A-T: Chromium	7440-47-3	50 µg/L	107	70	130
		EG094A-T: Copper	7440-50-8	50 µg/L	116	70	130
		EG094A-T: Lead	7439-92-1	50 µg/L	114	70	130



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike	SpikeRecovery(%)	Recovery Limits (%)	
				Concentration	MS	Low	High
<b>EG094T: Total metals in Fresh water by ORC-ICPMS (QCLot: 3232157) - continued</b>							
ES1327627-004	Anonymous	EG094A-T: Manganese	7439-96-5	50 µg/L	# Not Determined	70	130
		EG094A-T: Nickel	7440-02-0	50 µg/L	124	70	130
		EG094A-T: Zinc	7440-66-6	50 µg/L	# Not Determined	70	130
<b>EK040P: Fluoride by PC Titrator (QCLot: 3225581)</b>							
ES1327989-002	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	103	70	130
<b>EK040P: Fluoride by PC Titrator (QCLot: 3225583)</b>							
ES1328002-004	MK_MW11	EK040P: Fluoride	16984-48-8	5.0 mg/L	95.2	70	130
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3227667)</b>							
ES1328000-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	10 µg/L	84.0	70	130
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3229797)</b>							
ES1327989-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	25 µg/L	110	70	130
		EP074: Trichloroethene	79-01-6	25 µg/L	120	70	130
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3229797)</b>							
ES1327989-001	Anonymous	EP074: Chlorobenzene	108-90-7	25 µg/L	125	70	130
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3227669)</b>							
ES1328000-001	Anonymous	EP075(SIM): Phenol	108-95-2	20 µg/L	40.8	20	130
		EP075(SIM): 2-Chlorophenol	95-57-8	20 µg/L	85.0	60	130
		EP075(SIM): 2-Nitrophenol	88-75-5	20 µg/L	83.2	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	20 µg/L	83.5	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	20 µg/L	69.5	20	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3227669)</b>							
ES1328000-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	20 µg/L	78.3	70	130
		EP075(SIM): Pyrene	129-00-0	20 µg/L	89.4	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3227668)</b>							
ES1328000-001	Anonymous	EP071: C10 - C14 Fraction	----	200 µg/L	115	74	150
		EP071: C15 - C28 Fraction	----	300 µg/L	108	77	153
		EP071: C29 - C36 Fraction	----	200 µg/L	111	67	153
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229798)</b>							
ES1327989-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	112	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229802)</b>							
ES1327901-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	106	70	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3227668)</b>							
ES1328000-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	250 µg/L	98.8	74	150



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report				
				Spike	SpikeRecovery(%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3227668) - continued</b>								
ES1328000-001	Anonymous	EP071: >C16 - C34 Fraction	----	350 µg/L	104	77	153	
		EP071: >C34 - C40 Fraction	----	150 µg/L	111	67	153	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229798)</b>								
ES1327989-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	113	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229802)</b>								
ES1327901-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	108	70	130	
<b>EP080: BTEXN (QCLot: 3229798)</b>								
ES1327989-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	109	70	130	
		EP080: Toluene	108-88-3	25 µg/L	110	70	130	
		EP080: Ethylbenzene	100-41-4	25 µg/L	116	70	130	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	106	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	25 µg/L	114	70	130	
	EP080: Naphthalene	91-20-3	25 µg/L	113	70	130		
<b>EP080: BTEXN (QCLot: 3229802)</b>								
ES1327901-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	107	70	130	
		EP080: Toluene	108-88-3	25 µg/L	104	70	130	
		EP080: Ethylbenzene	100-41-4	25 µg/L	104	70	130	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	102	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	25 µg/L	105	70	130	
	EP080: Naphthalene	91-20-3	25 µg/L	101	70	130		

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
					Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit	
<b>ED045G: Chloride Discrete analyser (QCLot: 3225534)</b>											
ES1328001-001	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	98.2	----	70	130	----	----	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3225535)</b>											
ES1328001-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	----	70	130	----	----	
<b>EK040P: Fluoride by PC Titrator (QCLot: 3225581)</b>											
ES1327989-002	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	103	----	70	130	----	----	



Sub-Matrix: **WATER**

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>EK040P: Fluoride by PC Titrator (QCLot: 3225583)</b>										
ES1328002-004	MK_MW11	EK040P: Fluoride	16984-48-8	5.0 mg/L	95.2	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3227571)</b>										
ES1328003-007	Anonymous	EG035T: Mercury	7439-97-6	0.010 mg/L	81.6	----	70	130	----	----
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3227667)</b>										
ES1328000-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	10 µg/L	84.0	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3227668)</b>										
ES1328000-001	Anonymous	EP071: C10 - C14 Fraction	----	200 µg/L	115	----	74	150	----	----
		EP071: C15 - C28 Fraction	----	300 µg/L	108	----	77	153	----	----
		EP071: C29 - C36 Fraction	----	200 µg/L	111	----	67	153	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3227668)</b>										
ES1328000-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	250 µg/L	98.8	----	74	150	----	----
		EP071: >C16 - C34 Fraction	----	350 µg/L	104	----	77	153	----	----
		EP071: >C34 - C40 Fraction	----	150 µg/L	111	----	67	153	----	----
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3227669)</b>										
ES1328000-001	Anonymous	EP075(SIM): Phenol	108-95-2	20 µg/L	40.8	----	20	130	----	----
		EP075(SIM): 2-Chlorophenol	95-57-8	20 µg/L	85.0	----	60	130	----	----
		EP075(SIM): 2-Nitrophenol	88-75-5	20 µg/L	83.2	----	60	130	----	----
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	20 µg/L	83.5	----	70	130	----	----
		EP075(SIM): Pentachlorophenol	87-86-5	20 µg/L	69.5	----	20	130	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3227669)</b>										
ES1328000-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	20 µg/L	78.3	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	20 µg/L	89.4	----	70	130	----	----
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3228353)</b>										
ES1328000-001	Anonymous	EG094A-F: Arsenic	7440-38-2	50 µg/L	124	----	70	130	----	----
		EG094A-F: Cadmium	7440-43-9	12.5 µg/L	105	----	70	130	----	----
		EG094A-F: Chromium	7440-47-3	50 µg/L	107	----	70	130	----	----
		EG094A-F: Copper	7440-50-8	50 µg/L	103	----	70	130	----	----
		EG094A-F: Lead	7439-92-1	50 µg/L	94.2	----	70	130	----	----
		EG094A-F: Manganese	7439-96-5	50 µg/L	# Not Determined	----	70	130	----	----
		EG094A-F: Nickel	7440-02-0	50 µg/L	112	----	70	130	----	----
		EG094A-F: Zinc	7440-66-6	50 µg/L	113	----	70	130	----	----
		<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3228355)</b>								
ES1328002-006	MK_MW01	EG094A-F: Arsenic	7440-38-2	50 µg/L	117	----	70	130	----	----
		EG094A-F: Cadmium	7440-43-9	12.5 µg/L	109	----	70	130	----	----
		EG094A-F: Chromium	7440-47-3	50 µg/L	110	----	70	130	----	----
		EG094A-F: Copper	7440-50-8	50 µg/L	105	----	70	130	----	----
		EG094A-F: Lead	7439-92-1	50 µg/L	101	----	70	130	----	----



Sub-Matrix: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3228355) - continued</b>										
ES1328002-006	MK_MW01	EG094A-F: Manganese	7439-96-5	50 µg/L	# Not Determined	----	70	130	----	----
		EG094A-F: Nickel	7440-02-0	50 µg/L	111	----	70	130	----	----
		EG094A-F: Zinc	7440-66-6	50 µg/L	115	----	70	130	----	----
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3229115)</b>										
ES1328000-004	Anonymous	EG051G: Ferrous Iron	----	1.00 mg/L	# Not Determined	----	68	128	----	----
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3229797)</b>										
ES1327989-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	25 µg/L	110	----	70	130	----	----
		EP074: Trichloroethene	79-01-6	25 µg/L	120	----	70	130	----	----
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3229797)</b>										
ES1327989-001	Anonymous	EP074: Chlorobenzene	108-90-7	25 µg/L	125	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229798)</b>										
ES1327989-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	112	----	70	130	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229798)</b>										
ES1327989-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	113	----	70	130	----	----
<b>EP080: BTEXN (QCLot: 3229798)</b>										
ES1327989-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	109	----	70	130	----	----
		EP080: Toluene	108-88-3	25 µg/L	110	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	25 µg/L	116	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	106	----	70	130	----	----
		EP080: ortho-Xylene	95-47-6	25 µg/L	114	----	70	130	----	----
		EP080: Naphthalene	91-20-3	25 µg/L	113	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229802)</b>										
ES1327901-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	106	----	70	130	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229802)</b>										
ES1327901-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	108	----	70	130	----	----
<b>EP080: BTEXN (QCLot: 3229802)</b>										
ES1327901-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	107	----	70	130	----	----
		EP080: Toluene	108-88-3	25 µg/L	104	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	25 µg/L	104	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	102	----	70	130	----	----
		EP080: ortho-Xylene	95-47-6	25 µg/L	105	----	70	130	----	----
		EP080: Naphthalene	91-20-3	25 µg/L	101	----	70	130	----	----
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3230341)</b>										





Sub-Matrix: **WATER**

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
				Concentration	MS	MSD	Low	High	Value	Control Limit
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3230341) - continued</b>										
ES1328002-001	MK_MW03	EG035F: Mercury	7439-97-6	0.0100 mg/L	81.6	----	70	130	----	----
<b>EG094T: Total metals in Fresh water by ORC-ICPMS (QCLot: 3232157)</b>										
ES1327627-004	Anonymous	EG094A-T: Arsenic	7440-38-2	50 µg/L	126	----	70	130	----	----
		EG094A-T: Cadmium	7440-43-9	12.5 µg/L	111	----	70	130	----	----
		EG094A-T: Chromium	7440-47-3	50 µg/L	107	----	70	130	----	----
		EG094A-T: Copper	7440-50-8	50 µg/L	116	----	70	130	----	----
		EG094A-T: Lead	7439-92-1	50 µg/L	114	----	70	130	----	----
		EG094A-T: Manganese	7439-96-5	50 µg/L	# Not Determined	----	70	130	----	----
		EG094A-T: Nickel	7440-02-0	50 µg/L	124	----	70	130	----	----
		EG094A-T: Zinc	7440-66-6	50 µg/L	# Not Determined	----	70	130	----	----

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1328002</b>	Page	: 1 of 12
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: SYMPHONY DELTA WEST	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 20-DEC-2013
C-O-C number	: ----	Issue Date	: 03-JAN-2014
Sampler	: TS	No. of samples received	: 9
Order number	: 0207420/0207423	No. of samples analysed	: 9
Quote number	: SY/551/13 V4		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER** Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>ED037P: Alkalinity by PC Titrator</b>							
<b>Clear Plastic Bottle - Natural (ED037-P)</b> MK_MW03, MK_MW02, ML_MW07, MK_MW11, MK_MW09, MK_MW01	18-DEC-2013	---	01-JAN-2014	----	21-DEC-2013	01-JAN-2014	✓
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>							
<b>Clear Plastic Bottle - Natural (ED041G)</b> MK_MW03, MK_MW02, ML_MW07, MK_MW11, MK_MW09, MK_MW01	18-DEC-2013	---	15-JAN-2014	----	21-DEC-2013	15-JAN-2014	✓
<b>ED045G: Chloride Discrete analyser</b>							
<b>Clear Plastic Bottle - Natural (ED045G)</b> MK_MW03, MK_MW02, ML_MW07, MK_MW11, MK_MW09, MK_MW01	18-DEC-2013	---	15-JAN-2014	----	21-DEC-2013	15-JAN-2014	✓
<b>ED093F: Dissolved Major Cations</b>							
<b>Clear Plastic Bottle - Natural (ED093F)</b> MK_MW03, MK_MW02, ML_MW07, MK_MW11, MK_MW09, MK_MW01	18-DEC-2013	---	25-DEC-2013	----	21-DEC-2013	25-DEC-2013	✓
<b>EG035F: Dissolved Mercury by FIMS</b>							
<b>Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG035F)</b> MK_MW03, MK_MW02, ML_MW07, MK_MW11, MK_MW09, MK_MW01	18-DEC-2013	---	15-JAN-2014	----	27-DEC-2013	15-JAN-2014	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>							
<b>Amber Glass Bottle - Unpreserved (EG035T)</b> R01_181213-TS	18-DEC-2013	----	----	----	24-DEC-2013	15-JAN-2014	✓
<b>EG051G: Ferrous Iron by Discrete Analyser</b>							
<b>Clear Plastic Bottle - HCl - Filtered (EG051G)</b> MK_MW03, MK_MW02, ML_MW07, MK_MW11, MK_MW09, MK_MW01	18-DEC-2013	----	----	----	24-DEC-2013	25-DEC-2013	✓



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS</b>							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094A-F) MK_MW03, MK_MW02, ML_MW07, MK_MW11, MK_MW09, MK_MW01	18-DEC-2013	---	16-JUN-2014	----	24-DEC-2013	16-JUN-2014	✓
<b>EG094T: Total metals in Fresh water by ORC-ICPMS</b>							
Clear HDPE (U-T ORC) - Unspecified; Lab-acidified (EG094A-T) R01_181213-TS	18-DEC-2013	30-DEC-2013	16-JUN-2014	✓	30-DEC-2013	16-JUN-2014	✓
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS</b>							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094B-F) MK_MW03, MK_MW02, ML_MW07, MK_MW11, MK_MW09, MK_MW01	18-DEC-2013	---	16-JUN-2014	----	24-DEC-2013	16-JUN-2014	✓
<b>EG094T: Total metals in Fresh water by ORC-ICPMS</b>							
Clear HDPE (U-T ORC) - Unspecified; Lab-acidified (EG094B-T) R01_181213-TS	18-DEC-2013	30-DEC-2013	16-JUN-2014	✓	30-DEC-2013	16-JUN-2014	✓
<b>EK040P: Fluoride by PC Titrator</b>							
Clear Plastic Bottle - Natural (EK040P) MK_MW03, MK_MW02, ML_MW07, MK_MW11, MK_MW09, MK_MW01	18-DEC-2013	---	15-JAN-2014	----	21-DEC-2013	15-JAN-2014	✓
<b>EP066: Polychlorinated Biphenyls (PCB)</b>							
Amber Glass Bottle - Unpreserved (EP066) MK_MW03, MK_MW02, ML_MW07, MK_MW11, MK_MW09, MK_MW01	18-DEC-2013	24-DEC-2013	25-DEC-2013	✓	02-JAN-2014	11-FEB-2014	✓
<b>EP080/071: Total Petroleum Hydrocarbons</b>							
Amber Glass Bottle - Unpreserved (EP071) MK_MW03, MK_MW02, ML_MW07, MK_MW11, MK_MW09, MK_MW01, R01_181213-TS	18-DEC-2013	24-DEC-2013	25-DEC-2013	✓	02-JAN-2014	11-FEB-2014	✓
<b>EP074D: Fumigants</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MK_MW03, MK_MW02, ML_MW07, MK_MW11, MK_MW09, MK_MW01	18-DEC-2013	28-DEC-2013	01-JAN-2014	✓	28-DEC-2013	01-JAN-2014	✓
<b>EP074E: Halogenated Aliphatic Compounds</b>							
Amber VOC Vial - Sulfuric Acid (EP074) MK_MW03, MK_MW02, ML_MW07, MK_MW11, MK_MW09, MK_MW01	18-DEC-2013	28-DEC-2013	01-JAN-2014	✓	28-DEC-2013	01-JAN-2014	✓



Matrix: **WATER** Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP074F: Halogenated Aromatic Compounds</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> MK_MW03, ML_MW07, MK_MW09, MK_MW02, MK_MW11, MK_MW01	18-DEC-2013	28-DEC-2013	01-JAN-2014	✓	28-DEC-2013	01-JAN-2014	✓
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> MK_MW03, ML_MW07, MK_MW09, MK_MW02, MK_MW11, MK_MW01	18-DEC-2013	28-DEC-2013	01-JAN-2014	✓	28-DEC-2013	01-JAN-2014	✓
<b>EP074H: Naphthalene</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> MK_MW03, ML_MW07, MK_MW09, MK_MW02, MK_MW11, MK_MW01	18-DEC-2013	28-DEC-2013	01-JAN-2014	✓	28-DEC-2013	01-JAN-2014	✓
<b>EP074B: Oxygenated Compounds</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> MK_MW03, ML_MW07, MK_MW09, MK_MW02, MK_MW11, MK_MW01	18-DEC-2013	28-DEC-2013	01-JAN-2014	✓	28-DEC-2013	01-JAN-2014	✓
<b>EP074C: Sulfonated Compounds</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> MK_MW03, ML_MW07, MK_MW09, MK_MW02, MK_MW11, MK_MW01	18-DEC-2013	28-DEC-2013	01-JAN-2014	✓	28-DEC-2013	01-JAN-2014	✓
<b>EP074G: Trihalomethanes</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> MK_MW03, ML_MW07, MK_MW09, MK_MW02, MK_MW11, MK_MW01	18-DEC-2013	28-DEC-2013	01-JAN-2014	✓	28-DEC-2013	01-JAN-2014	✓
<b>EP075(SIM)A: Phenolic Compounds</b>							
<b>Amber Glass Bottle - Unpreserved (EP075(SIM))</b> MK_MW03, ML_MW07, MK_MW09, MK_MW02, MK_MW11, MK_MW01	18-DEC-2013	24-DEC-2013	25-DEC-2013	✓	02-JAN-2014	11-FEB-2014	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>							
<b>Amber Glass Bottle - Unpreserved (EP075(SIM))</b> MK_MW03, ML_MW07, MK_MW09, MK_MW02, MK_MW11, MK_MW01	18-DEC-2013	24-DEC-2013	25-DEC-2013	✓	02-JAN-2014	11-FEB-2014	✓



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP080: BTEXN</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MK_MW03, ML_MW07, MK_MW09,	MK_MW02, MK_MW11, MK_MW01	18-DEC-2013	28-DEC-2013	01-JAN-2014	✓	28-DEC-2013	01-JAN-2014	✓
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> R01_181213-TS, TB2	TS3,	18-DEC-2013	31-DEC-2013	01-JAN-2014	✓	31-DEC-2013	01-JAN-2014	✓
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MK_MW03, ML_MW07, MK_MW09,	MK_MW02, MK_MW11, MK_MW01	18-DEC-2013	28-DEC-2013	01-JAN-2014	✓	28-DEC-2013	01-JAN-2014	✓
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> R01_181213-TS,	TB2	18-DEC-2013	31-DEC-2013	01-JAN-2014	✓	31-DEC-2013	01-JAN-2014	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaural	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Alkalinity by PC Titrator	ED037-P	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	8	12.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	3	22	13.6	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	3	22	13.6	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	4	38	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	2	12	16.7	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	8	12.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	17	11.8	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-T	1	8	12.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-T	1	7	14.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	15	13.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	4	40	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
Alkalinity by PC Titrator	ED037-P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	2	22	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	2	22	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	2	38	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-T	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-T	1	7	14.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	15	6.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							





Matrix: **WATER**

Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Method Blanks (MB) - Continued</b>							
Chloride by Discrete Analyser	ED045G	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	2	22	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	2	22	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	2	38	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-T	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-T	1	7	14.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	15	6.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
Chloride by Discrete Analyser	ED045G	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	2	22	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	2	38	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-T	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	15	6.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Sulfate (Turbidimetric) as SO <sub>4</sub> <sup>2-</sup> by Discrete Analyser	ED041G	WATER	APHA 21st ed., 4500-SO <sub>4</sub> Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> <sup>2-</sup> concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Chloride by Discrete Analyser	ED045G	WATER	APHA 21st ed., 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	Major Cations is determined based on APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um filtered sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Hardness parameters are calculated based on APHA 21st ed., 2340 B. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Dissolved Mercury by FIMS	EG035F	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) Samples are 0.45 um filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Total Mercury by FIMS	EG035T	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Ferrous Iron by Discrete Analyser	EG051G	WATER	APHA 21st ed., 3500 Fe-B. A colorimetric determination based on the reaction between phenanthroline and ferrous iron at pH 3.2-3.3 to form an orange-red complex that is measured against a five-point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)



Analytical Methods	Method	Matrix	Method Descriptions
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Total Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-T	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Total Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-T	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Fluoride by PC Titrator	EK040P	WATER	APHA 21st ed., 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by Turbi SO4 by DA. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Polychlorinated Biphenyls (PCB)	EP066	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
TPH - Semivolatle Fraction	EP071	WATER	USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Volatile Organic Compounds	EP074	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
TPH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)



<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Digestion for Total Recoverable Metals - ORC	EN25-ORC	WATER	Modified USEPA SW846-3005. This is an Ultrapure Nitric acid digestion procedure used to prepare surface and ground water samples for analysis by ORC- ICPMS. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Lab Acidification of Metals	EN80	WATER	USEPA Method 200.8
Lab Acidification of Dissolved Metals	EN80F	WATER	US EPA Method 200.8
Separatory Funnel Extraction of Liquids	ORG14	WATER	USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.



## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Laboratory Control Spike (LCS) Recoveries</b>							
EP074E: Halogenated Aliphatic Compounds	3855103-002	----	Vinyl chloride	75-01-4	130 %	69.4-129%	Recovery greater than upper control limit
EP075(SIM)A: Phenolic Compounds	3852928-011	----	Pentachlorophenol	87-86-5	99.8 %	8.7-95%	Recovery greater than upper control limit
<b>Matrix Spike (MS) Recoveries</b>							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	ES1328001-001	Anonymous	Sulfate as SO4 - Turbidimetric	14808-79-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG051G: Ferrous Iron by Discrete Analyser	ES1328000-004	Anonymous	Ferrous Iron	----	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG094F: Dissolved Metals in Fresh Water by ORC-ICP	ES1328002-006	MK_MW01	Manganese	7439-96-5	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG094F: Dissolved Metals in Fresh Water by ORC-ICP	ES1328000-001	Anonymous	Manganese	7439-96-5	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG094T: Total metals in Fresh water by ORC-ICPMS	ES1327627-004	Anonymous	Manganese	7439-96-5	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG094T: Total metals in Fresh water by ORC-ICPMS	ES1327627-004	Anonymous	Zinc	7440-66-6	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.

#### Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- No Analysis Holding Time Outliers exist.



### ***Outliers : Frequency of Quality Control Samples***

The following report highlights breaches in the Frequency of Quality Control Samples.

- **No Quality Control Sample Frequency Outliers exist.**
-

**SAMPLE RECEIPT NOTIFICATION (SRN)****Comprehensive Report**

<b>Work Order</b>	: <b>ES1328002</b>		
<b>Client</b>	: <b>ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: MR JONATHAN LEKAWSKI	<b>Contact</b>	: Barbara Hanna
<b>Address</b>	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: jonathan.lekawski@erm.com	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: SYMPHONY DELTA WEST	<b>Page</b>	: 1 of 3
<b>Order number</b>	: 0207420/0207423	<b>Quote number</b>	: ES2013ENVRES0360 (SY/551/13 V4)
<b>C-O-C number</b>	: ----	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b>	: ----		
<b>Sampler</b>	: TS		

**Dates**

<b>Date Samples Received</b>	: 20-DEC-2013	<b>Issue Date</b>	: 21-DEC-2013 10:07
<b>Client Requested Due Date</b>	: 03-JAN-2014	<b>Scheduled Reporting Date</b>	: <b>03-JAN-2014</b>

**Delivery Details**

<b>Mode of Delivery</b>	: Carrier	<b>Temperature</b>	: 2.5°C - Ice present
<b>No. of coolers/boxes</b>	: 7 HARD	<b>No. of samples received</b>	: 9
<b>Security Seal</b>	: Intact.	<b>No. of samples analysed</b>	: 9

**General Comments**

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Sample containers do not comply to pretreatment / preservation standards (AS, APHA, USEPA). Please refer to the Sample Container(s)/Preservation Non-Compliance Log at the end of this report for details.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.







Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - W-24 TPHIBTEX/PAH/Phenols
ES1328002-001	18-DEC-2013 09:50	MK_MW03	✓
ES1328002-002	18-DEC-2013 10:48	MK_MW02	✓
ES1328002-003	18-DEC-2013 13:17	ML_MW07	✓
ES1328002-004	18-DEC-2013 14:21	MK_MW11	✓
ES1328002-005	18-DEC-2013 15:25	MK_MW09	✓
ES1328002-006	18-DEC-2013 16:22	MK_MW01	✓

### Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

### Requested Deliverables

#### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

#### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

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Email jonathan.lekawski@erm.com

#### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )

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Email symphony.deltawest@erm.com

#### SYMPHONY ERARING

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

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Email Symphony.Eraring@erm.com

#### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

# CHAIN OF CUSTODY

ALS Laboratory  
Please Tick ->

SYDNEY  
110-112 Victoria Road  
Sydney NSW 1570  
Ph: 61 61 8320 3138  
Fax: 61 61 8320 3139  
Email: sydney@als.com.au

MELBOURNE  
100-102 Victoria Road  
Melbourne VIC 3000  
Ph: 61 3 9587 9222  
Fax: 61 3 9587 9223  
Email: melbourne@als.com.au

PERTH  
100-102 Victoria Road  
Perth WA 6000  
Ph: 61 8 9447 9222  
Fax: 61 8 9447 9223  
Email: perth@als.com.au

BRISBANE  
100-102 Victoria Road  
Brisbane QLD 4000  
Ph: 61 7 3250 9222  
Fax: 61 7 3250 9223  
Email: brisbane@als.com.au

CLIENT: **ERM** TURNAROUND REQUIREMENTS:  Standard TAT (let due date)  Non Standard (urgent TAT (let due date))

OFFICE: **GRAND FLOOR, 35 BAUNDERS ST, PYRMONT NSW 2000** (Standard TAT may be longer for some tests e.g. Urea Trace Organic) ALS QUOTE NO: **51851174 VA**

PROJECT: **Symphony - Delta West** PROJECT MANAGER: **Jonathan Johnson** CONTRACT PH: **8564 8888**

ORDER NUMBER: **0207440207423** SAMPLE MOBILE: **045 960035** RELINQUISHED BY: **Maree Shaw**

SAMPLER: **T. Snow** EDD PROGRAM (if default): **ESDAP/DFXLS** DATE/TIME: **19-12-13 10:30**

COC emailed to ALS? **YES (NO)** Email Reports to (will default to PFI if no other addresses are listed): **Symphony/DeltaWest@erm.com** RECEIVED BY: **Steven**

Email Invoice to (will default to PFI if no other addresses are listed): **Symphony/DeltaWest@erm.com** DATE/TIME: **20/1/13 8:30**

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: **FRONT ALBERT INF-ORINATION**

LAB ID	SAMPLE ID	DATE / TIME	REITER	TYPE & PRESERVATIVE (codes below)	TOTAL CONTAINERS	ANALYSIS REQUESTED (including SITES, pH, Saline Cation must be used to allow scale price) (When Month is required, specify front container holder required or Unpreserved (food filtered) bottle required)										Additional Information
						W-4 (TPH/TRH (C-356 or 40)BTEXM)	8 Ultra Trace Dissolved Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg) -	Additional Metals Ultra Trace - Se, Ba, F, Mn	Ferrous Iron	PAH/Phenols	VOC Scan	PCB	Cations/Anions			
1	MK-MW03	18-12-13/09:00	White	2x Vials 1x Ultra Trace Metals 1x Heavy Metals 1x Unpreserved plastic	6	X	X	X	X	X	X	X	X	X		
2	MK-MW02	1/10-48	"	"	6	X	X	X	X	X	X	X	X	X		
3	MK-MW07	1/3-17	"	"	6	X	X	X	X	X	X	X	X	X		
4	MK-MW11	1/4-21	"	"	6	X	X	X	X	X	X	X	X	X		
5	MK-MW09	1/5-25	"	"	6	X	X	X	X	X	X	X	X	X		
6	MK-MW01	1/16-22	"	"	6	X	X	X	X	X	X	X	X	X		
7	ROL-181213-TS	"	"	"	4	X	X	X	X	X	X	X	X	X		
8	TS3	"	"	"	1	X	X	X	X	X	X	X	X	X		
9	T82	"	"	"	1	X	X	X	X	X	X	X	X	X		

Major Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORG = Nitric Preserved ORG; SH = Sodium Hydroxide Preserved; S = Sodium Hydroxide Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation bottle; SP = Sulfuric P  
 V = VOA Vol HCl Preserved; VS = VOA Vol Sulfuric Preserved; VAS = VOA Vol Sulfuric Preserved; NV = Nitrogen Unpreserved; NS = Nitrogen Preserved; NH = HCl Preserved Plastic; NH = HCl Preserved Speciation bottle; SP = Sulfuric P  
 I = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulfate Soils; U = Unpreserved Bag

Environmental Division  
Sydney  
Work Order  
**ES1328002**



Telephone : + 61-2-8784 8555

✓ SYDNEY

## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>ES1328003</b> <b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : MR JONATHAN LEKAWSKI <b>Address</b> : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007  <b>E-mail</b> : jonathan.lekawski@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800 <b>Project</b> : SYMPHONY DELTA WEST <b>Order number</b> : 0207420/0207423 <b>C-O-C number</b> : ---- <b>Sampler</b> : ---- <b>Site</b> : ----  <b>Quote number</b> : SY/551/13 V4	<b>Page</b> : 1 of 13  <b>Laboratory</b> : Environmental Division Sydney <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164  <b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555 <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement  <b>Date Samples Received</b> : 20-DEC-2013 <b>Issue Date</b> : 03-JAN-2014  <b>No. of samples received</b> : 7 <b>No. of samples analysed</b> : 7
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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Organics
Sanjeshni Jyoti Mala	Senior Chemist Volatile	Sydney Organics



### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MB_MW05	ML_MW08	MB_MW02	ME_MW04	MB_MW03
				18-DEC-2013 16:30	18-DEC-2013 15:25	18-DEC-2013 14:06	18-DEC-2013 11:52	18-DEC-2013 10:39
Compound	CAS Number	LOR	Unit	ES1328003-001	ES1328003-002	ES1328003-003	ES1328003-004	ES1328003-005
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	22	24	122	314	17
Total Alkalinity as CaCO3	----	1	mg/L	22	24	122	314	17
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	204	95	166	137	160
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	64	37	36	119	34
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	23	8	47	36	18
Magnesium	7439-95-4	1	mg/L	19	9	34	86	21
Sodium	7440-23-5	1	mg/L	56	48	35	65	38
Potassium	7440-09-7	1	mg/L	6	4	6	6	7
<b>EG020F: Dissolved Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	0.001	<0.001	0.005	0.004	<0.001
Cadmium	7440-43-9	0.0001	mg/L	0.0004	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	0.001	0.002	0.003	0.002	0.001
Nickel	7440-02-0	0.001	mg/L	0.138	0.066	0.106	0.202	0.046
Lead	7439-92-1	0.001	mg/L	0.008	0.002	<0.001	0.001	<0.001
Zinc	7440-66-6	0.005	mg/L	0.460	0.148	0.331	0.110	0.123
Manganese	7439-96-5	0.001	mg/L	1.50	6.49	3.71	11.2	1.12
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05
<b>EG035F: Dissolved Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
<b>EG051G: Ferrous Iron by Discrete Analyser</b>								
Ferrous Iron	----	0.05	mg/L	21.6	11.7	12.1	15.8	10.9
<b>EK040P: Fluoride by PC Titrator</b>								
Fluoride	16984-48-8	0.1	mg/L	0.1	<0.1	0.1	0.1	<0.1
<b>EN055: Ionic Balance</b>								
Total Anions	----	0.01	meq/L	6.49	3.50	6.91	12.5	4.63
Total Cations	----	0.01	meq/L	6.25	3.50	7.17	11.9	4.46



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

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				18-DEC-2013 16:30	18-DEC-2013 15:25	18-DEC-2013 14:06	18-DEC-2013 11:52	18-DEC-2013 10:39
Compound	CAS Number	LOR	Unit	ES1328003-001	ES1328003-002	ES1328003-003	ES1328003-004	ES1328003-005
<b>EN055: Ionic Balance - Continued</b>								
Ionic Balance	----	0.01	%	1.24	0.04	1.80	2.29	1.89
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	1	µg/L	----	<1	----	----	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	5	µg/L	----	<5	----	----	----
Isopropylbenzene	98-82-8	5	µg/L	----	<5	----	----	----
n-Propylbenzene	103-65-1	5	µg/L	----	<5	----	----	----
1.3.5-Trimethylbenzene	108-67-8	5	µg/L	----	<5	----	----	----
sec-Butylbenzene	135-98-8	5	µg/L	----	<5	----	----	----
1.2.4-Trimethylbenzene	95-63-6	5	µg/L	----	<5	----	----	----
tert-Butylbenzene	98-06-6	5	µg/L	----	<5	----	----	----
p-Isopropyltoluene	99-87-6	5	µg/L	----	<5	----	----	----
n-Butylbenzene	104-51-8	5	µg/L	----	<5	----	----	----
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	50	µg/L	----	<50	----	----	----
2-Butanone (MEK)	78-93-3	50	µg/L	----	<50	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	----	<50	----	----	----
2-Hexanone (MBK)	591-78-6	50	µg/L	----	<50	----	----	----
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	5	µg/L	----	<5	----	----	----
<b>EP074D: Fumigants</b>								
2.2-Dichloropropane	594-20-7	5	µg/L	----	<5	----	----	----
1.2-Dichloropropane	78-87-5	5	µg/L	----	<5	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	----	<5	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	----	<5	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	----	<5	----	----	----
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	50	µg/L	----	<50	----	----	----
Chloromethane	74-87-3	50	µg/L	----	<50	----	----	----
Vinyl chloride	75-01-4	50	µg/L	----	<50	----	----	----
Bromomethane	74-83-9	50	µg/L	----	<50	----	----	----
Chloroethane	75-00-3	50	µg/L	----	<50	----	----	----
Trichlorofluoromethane	75-69-4	50	µg/L	----	<50	----	----	----





## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

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Compound	CAS Number	LOR	Unit	ES1328003-001	ES1328003-002	ES1328003-003	ES1328003-004	ES1328003-005
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
1.1-Dichloroethene	75-35-4	5	µg/L	----	<5	----	----	----
Iodomethane	74-88-4	5	µg/L	----	<5	----	----	----
trans-1.2-Dichloroethene	156-60-5	5	µg/L	----	<5	----	----	----
1.1-Dichloroethane	75-34-3	5	µg/L	----	<5	----	----	----
cis-1.2-Dichloroethene	156-59-2	5	µg/L	----	<5	----	----	----
1.1.1-Trichloroethane	71-55-6	5	µg/L	----	<5	----	----	----
1.1-Dichloropropylene	563-58-6	5	µg/L	----	<5	----	----	----
Carbon Tetrachloride	56-23-5	5	µg/L	----	<5	----	----	----
1.2-Dichloroethane	107-06-2	5	µg/L	----	<5	----	----	----
Trichloroethene	79-01-6	5	µg/L	----	<5	----	----	----
Dibromomethane	74-95-3	5	µg/L	----	<5	----	----	----
1.1.2-Trichloroethane	79-00-5	5	µg/L	----	<5	----	----	----
1.3-Dichloropropane	142-28-9	5	µg/L	----	<5	----	----	----
Tetrachloroethene	127-18-4	5	µg/L	----	<5	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	----	<5	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	----	<5	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	----	<5	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	----	<5	----	----	----
1.2.3-Trichloropropane	96-18-4	5	µg/L	----	<5	----	----	----
Pentachloroethane	76-01-7	5	µg/L	----	<5	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	----	<5	----	----	----
Hexachlorobutadiene	87-68-3	5	µg/L	----	<5	----	----	----
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	5	µg/L	----	<5	----	----	----
Bromobenzene	108-86-1	5	µg/L	----	<5	----	----	----
2-Chlorotoluene	95-49-8	5	µg/L	----	<5	----	----	----
4-Chlorotoluene	106-43-4	5	µg/L	----	<5	----	----	----
1.3-Dichlorobenzene	541-73-1	5	µg/L	----	<5	----	----	----
1.4-Dichlorobenzene	106-46-7	5	µg/L	----	<5	----	----	----
1.2-Dichlorobenzene	95-50-1	5	µg/L	----	<5	----	----	----
1.2.4-Trichlorobenzene	120-82-1	5	µg/L	----	<5	----	----	----
1.2.3-Trichlorobenzene	87-61-6	5	µg/L	----	<5	----	----	----
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	5	µg/L	----	<5	----	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

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				18-DEC-2013 16:30	18-DEC-2013 15:25	18-DEC-2013 14:06	18-DEC-2013 11:52	18-DEC-2013 10:39
Compound	CAS Number	LOR	Unit	ES1328003-001	ES1328003-002	ES1328003-003	ES1328003-004	ES1328003-005
<b>EP074G: Trihalomethanes - Continued</b>								
Bromodichloromethane	75-27-4	5	µg/L	----	<5	----	----	----
Dibromochloromethane	124-48-1	5	µg/L	----	<5	----	----	----
Bromoform	75-25-2	5	µg/L	----	<5	----	----	----
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	7	µg/L	----	<7	----	----	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MB_MW05	ML_MW08	MB_MW02	ME_MW04	MB_MW03
				18-DEC-2013 16:30	18-DEC-2013 15:25	18-DEC-2013 14:06	18-DEC-2013 11:52	18-DEC-2013 10:39
Compound	CAS Number	LOR	Unit	ES1328003-001	ES1328003-002	ES1328003-003	ES1328003-004	ES1328003-005
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	----	57.0	----	----	----
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	121	----	----	----
Toluene-D8	2037-26-5	0.1	%	----	117	----	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MB_MW05	ML_MW08	MB_MW02	ME_MW04	MB_MW03
				18-DEC-2013 16:30	18-DEC-2013 15:25	18-DEC-2013 14:06	18-DEC-2013 11:52	18-DEC-2013 10:39
Compound	CAS Number	LOR	Unit	ES1328003-001	ES1328003-002	ES1328003-003	ES1328003-004	ES1328003-005
<b>EP074S: VOC Surrogates - Continued</b>								
4-Bromofluorobenzene	460-00-4	0.1	%	----	114	----	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	18.6	24.8	20.8	17.6	17.5
2-Chlorophenol-D4	93951-73-6	0.1	%	44.9	36.2	47.8	42.2	41.5
2,4,6-Tribromophenol	118-79-6	0.1	%	62.2	36.1	65.9	53.3	46.8
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	70.2	39.2	57.8	51.0	46.8
Anthracene-d10	1719-06-8	0.1	%	74.9	46.1	81.5	71.0	71.0
4-Terphenyl-d14	1718-51-0	0.1	%	78.2	51.2	90.9	79.2	75.8
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	111	122	106	89.6	95.9
Toluene-D8	2037-26-5	0.1	%	117	115	119	124	119
4-Bromofluorobenzene	460-00-4	0.1	%	116	105	115	120	116



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MF_MW03	RB01_181213CF	---	---	---
				18-DEC-2013 09:13	18-DEC-2013 15:00	---	---	---
Compound	CAS Number	LOR	Unit	ES1328003-006	ES1328003-007	---	---	---
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	---	---	---	---
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	---	---	---	---
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	26	---	---	---	---
Total Alkalinity as CaCO3	---	1	mg/L	26	---	---	---	---
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	66	---	---	---	---
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	52	---	---	---	---
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	17	---	---	---	---
Magnesium	7439-95-4	1	mg/L	13	---	---	---	---
Sodium	7440-23-5	1	mg/L	31	---	---	---	---
Potassium	7440-09-7	1	mg/L	6	---	---	---	---
<b>EG020F: Dissolved Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	0.003	---	---	---	---
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	---	---	---	---
Chromium	7440-47-3	0.001	mg/L	<0.001	---	---	---	---
Copper	7440-50-8	0.001	mg/L	0.007	---	---	---	---
Nickel	7440-02-0	0.001	mg/L	0.116	---	---	---	---
Lead	7439-92-1	0.001	mg/L	0.005	---	---	---	---
Zinc	7440-66-6	0.005	mg/L	0.112	---	---	---	---
Manganese	7439-96-5	0.001	mg/L	1.13	---	---	---	---
Selenium	7782-49-2	0.01	mg/L	<0.01	---	---	---	---
Boron	7440-42-8	0.05	mg/L	<0.05	---	---	---	---
<b>EG020T: Total Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	---	<0.001	---	---	---
Cadmium	7440-43-9	0.0001	mg/L	---	<0.0001	---	---	---
Chromium	7440-47-3	0.001	mg/L	---	<0.001	---	---	---
Copper	7440-50-8	0.001	mg/L	---	<0.001	---	---	---
Nickel	7440-02-0	0.001	mg/L	---	<0.001	---	---	---
Lead	7439-92-1	0.001	mg/L	---	<0.001	---	---	---
Zinc	7440-66-6	0.005	mg/L	---	<0.005	---	---	---
Manganese	7439-96-5	0.001	mg/L	---	<0.001	---	---	---



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				MF_MW03	RB01_181213CF	---	---	---
				18-DEC-2013 09:13	18-DEC-2013 15:00	---	---	---
Compound	CAS Number	LOR	Unit	ES1328003-006	ES1328003-007	---	---	---
<b>EG020T: Total Metals by ICP-MS - Continued</b>								
Selenium	7782-49-2	0.01	mg/L	---	<0.01	---	---	---
Boron	7440-42-8	0.05	mg/L	---	<0.05	---	---	---
<b>EG035F: Dissolved Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	---	---	---	---
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	---	<0.0001	---	---	---
<b>EG051G: Ferrous Iron by Discrete Analyser</b>								
Ferrous Iron	---	0.05	mg/L	<b>0.44</b>	---	---	---	---
<b>EK040P: Fluoride by PC Titrator</b>								
Fluoride	16984-48-8	0.1	mg/L	<0.1	---	---	---	---
<b>EN055: Ionic Balance</b>								
Total Anions	---	0.01	meq/L	<b>3.36</b>	---	---	---	---
Total Cations	---	0.01	meq/L	<b>3.42</b>	---	---	---	---
Ionic Balance	---	0.01	%	<b>0.87</b>	---	---	---	---
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	---	---	---
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	---	---	---
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	---	---	---
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	---	---	---
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	---	---	---
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	---	---	---
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	---	---	---
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	---	---	---
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	---	---	---
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	---	---	---
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	---	---	---
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	---	---	---
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	---	---	---
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	---	---	---
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	---	---	---
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	---	---	---
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	---	---	---



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				MF_MW03	RB01_181213CF	---	---	---
				18-DEC-2013 09:13	18-DEC-2013 15:00	---	---	---
				ES1328003-006	ES1328003-007	---	---	---
Compound	CAS Number	LOR	Unit					
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	---	---	---
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	---	---	---
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	---	---	---
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	---	---	---
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	---	---	---
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	---	---	---
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	---	---	---
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	---	---	---
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	---	---	---
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	---	---	---
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	---	---	---
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	---	---	---
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	---	---	---
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	20	µg/L	<20	<20	---	---	---
C10 - C14 Fraction	----	50	µg/L	<50	<50	---	---	---
C15 - C28 Fraction	----	100	µg/L	<100	<100	---	---	---
C29 - C36 Fraction	----	50	µg/L	<50	<50	---	---	---
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	---	---	---
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	---	---	---
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	---	---	---
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	---	---	---
>C16 - C34 Fraction	----	100	µg/L	<100	<100	---	---	---
>C34 - C40 Fraction	----	100	µg/L	<100	<100	---	---	---
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	---	---	---
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	---	---	---
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	<1	<1	---	---	---
Toluene	108-88-3	2	µg/L	<2	<2	---	---	---
Ethylbenzene	100-41-4	2	µg/L	<2	<2	---	---	---
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	---	---	---





## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				MF_MW03	RB01_181213CF	---	---	---
				18-DEC-2013 09:13	18-DEC-2013 15:00	---	---	---
				ES1328003-006	ES1328003-007	---	---	---
Compound	CAS Number	LOR	Unit					
<b>EP080: BTEXN - Continued</b>								
ortho-Xylene	95-47-6	2	µg/L	<2	<2	---	---	---
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	---	---	---
^ Sum of BTEX	----	1	µg/L	<1	<1	---	---	---
Naphthalene	91-20-3	5	µg/L	<5	<5	---	---	---
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	20.5	17.6	---	---	---
2-Chlorophenol-D4	93951-73-6	0.1	%	42.1	46.5	---	---	---
2.4.6-Tribromophenol	118-79-6	0.1	%	63.3	56.1	---	---	---
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	34.4	51.1	---	---	---
Anthracene-d10	1719-06-8	0.1	%	73.6	77.2	---	---	---
4-Terphenyl-d14	1718-51-0	0.1	%	82.6	84.2	---	---	---
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	136	88.1	---	---	---
Toluene-D8	2037-26-5	0.1	%	122	111	---	---	---
4-Bromofluorobenzene	460-00-4	0.1	%	120	109	---	---	---



## Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP066S: PCB Surrogate</b>			
Decachlorobiphenyl	2051-24-3	28.5	129
<b>EP074S: VOC Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	78.3	133.2
Toluene-D8	2037-26-5	79.1	128.9
4-Bromofluorobenzene	460-00-4	80.8	123.7
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	10.0	44
2-Chlorophenol-D4	93951-73-6	14	94
2,4,6-Tribromophenol	118-79-6	17	125
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27.4	113
4-Terphenyl-d14	1718-51-0	32	112
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

## QUALITY CONTROL REPORT

<b>Work Order</b>	: <b>ES1328003</b>	Page	: 1 of 19
<b>Client</b>	: <b>ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: MR JONATHAN LEKAWSKI	<b>Contact</b>	: Barbara Hanna
<b>Address</b>	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
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<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: SYMPHONY DELTA WEST	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b>	: ----	<b>Date Samples Received</b>	: 20-DEC-2013
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: 03-JAN-2014
<b>Sampler</b>	: ----	<b>No. of samples received</b>	: 7
<b>Order number</b>	: 0207420/0207423	<b>No. of samples analysed</b>	: 7
<b>Quote number</b>	: SY/551/13 V4		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Organics
Sanjeshni Jyoti Mala	Senior Chemist Volatile	Sydney Organics



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### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :            Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
                  CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
                  LOR = Limit of reporting  
                  RPD = Relative Percentage Difference  
                  # = Indicates failed QC



## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>ED037P: Alkalinity by PC Titrator (QC Lot: 3225582)</b>									
ES1328000-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	356	354	0.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	356	354	0.5	0% - 20%
ES1328002-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	196	196	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	196	196	0.0	0% - 20%
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3227256)</b>									
ES1327989-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	108	107	0.0	0% - 20%
ES1328003-005	MB_MW03	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	160	161	0.9	0% - 20%
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3229847)</b>									
ES1327849-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	68	67	0.0	0% - 20%
ES1328100-008	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	220	237	7.5	0% - 20%
<b>ED045G: Chloride Discrete analyser (QC Lot: 3227255)</b>									
ES1327989-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	100	97	3.0	0% - 20%
ES1328003-005	MB_MW03	ED045G: Chloride	16887-00-6	1	mg/L	34	32	8.0	0% - 20%
<b>ED045G: Chloride Discrete analyser (QC Lot: 3229845)</b>									
ES1327849-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	12	11	0.0	0% - 50%
ES1328100-008	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	420	420	0.0	0% - 20%
<b>ED093F: Dissolved Major Cations (QC Lot: 3227254)</b>									
ES1327989-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	21	21	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	25	25	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	78	78	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	8	8	0.0	No Limit
ES1328003-006	MF_MW03	ED093F: Calcium	7440-70-2	1	mg/L	17	16	0.0	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	13	13	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	33	33	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	6	6	0.0	No Limit
<b>ED093F: Dissolved Major Cations (QC Lot: 3229846)</b>									
ES1328116-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	14	11	21.6	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	10	9	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	528	461	13.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	5	4	25.5	No Limit
ES1328190-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	47	47	0.0	0% - 20%



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>ED093F: Dissolved Major Cations (QC Lot: 3229846) - continued</b>									
ES1328190-001	Anonymous	ED093F: Magnesium	7439-95-4	1	mg/L	13	13	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	4	4	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	4	4	0.0	No Limit
<b>EG020F: Dissolved Metals by ICP-MS (QC Lot: 3230349)</b>									
ES1327960-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.002	0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.020	0.021	6.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES1328047-002	Anonymous	EG020A-F: Boron	7440-42-8	0.05	mg/L	0.08	0.08	0.0	No Limit
		EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.952	0.941	1.2	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.010	0.008	22.4	No Limit
ES1327960-001	Anonymous	EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	2.42	2.54	4.8	0% - 20%
		EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.026	0.026	0.0	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.026	0.024	9.3	No Limit
ES1328047-003	Anonymous	EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	0.06	0.07	0.0	No Limit
		EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.004	0.003	29.6	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.947	0.926	2.2	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.004	0.004	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG020T: Total Metals by ICP-MS (QC Lot: 3230346) - continued</b>									
ES1328047-003	Anonymous	EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.019	0.015	27.0	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	2.65	2.85	7.3	0% - 20%
<b>EG035F: Dissolved Mercury by FIMS (QC Lot: 3230351)</b>									
ES1328003-001	MB_MW05	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3227571)</b>									
ES1328002-007	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1328109-046	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
<b>EG051G: Ferrous Iron by Discrete Analyser (QC Lot: 3229115)</b>									
ES1328000-004	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	16.7	16.7	0.06	0% - 20%
ES1328002-003	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	3.04	3.03	0.4	0% - 20%
<b>EK040P: Fluoride by PC Titrator (QC Lot: 3225583)</b>									
ES1328002-004	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
ES1328012-001	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3229766)</b>									
ES1327988-002	Anonymous	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
ES1327988-003	Anonymous	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
<b>EP074B: Oxygenated Compounds (QC Lot: 3229766)</b>									
ES1327988-002	Anonymous	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
ES1327988-003	Anonymous	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit





Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074B: Oxygenated Compounds (QC Lot: 3229766) - continued</b>									
ES1327988-003	Anonymous	EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
<b>EP074C: Sulfonated Compounds (QC Lot: 3229766)</b>									
ES1327988-002	Anonymous	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
ES1327988-003	Anonymous	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
<b>EP074D: Fumigants (QC Lot: 3229766)</b>									
ES1327988-002	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
ES1327988-003	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3229766)</b>									
ES1327988-002	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3229766) - continued</b>									
ES1327988-002	Anonymous	EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit
ES1327988-003	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3229766)</b>									
ES1327988-002	Anonymous	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3229766) - continued</b>									
ES1327988-002	Anonymous	EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
ES1327988-003	Anonymous	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
<b>EP074G: Trihalomethanes (QC Lot: 3229766)</b>									
ES1327988-002	Anonymous	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
ES1327988-003	Anonymous	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
<b>EP074H: Naphthalene (QC Lot: 3229766)</b>									
ES1327988-002	Anonymous	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit
ES1327988-003	Anonymous	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3229767)</b>									
ES1327988-002	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1327988-003	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3229827)</b>									
ES1328003-001	MB_MW05	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1328079-004	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3229767)</b>									
ES1327988-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES1327988-003	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3229827)</b>									
ES1328003-001	MB_MW05	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES1328079-004	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3229767)</b>									
ES1327988-002	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP080: BTEXN (QC Lot: 3229767) - continued</b>									
ES1327988-002	Anonymous	EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
		ES1327988-003	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1
EP080: Toluene	108-88-3	2		µg/L	<2	<2	0.0	No Limit	
EP080: Ethylbenzene	100-41-4	2		µg/L	<2	<2	0.0	No Limit	
EP080: meta- & para-Xylene	108-38-3 106-42-3	2		µg/L	<2	<2	0.0	No Limit	
EP080: ortho-Xylene	95-47-6	2		µg/L	<2	<2	0.0	No Limit	
EP080: Naphthalene	91-20-3	5		µg/L	<5	<5	0.0	No Limit	
<b>EP080: BTEXN (QC Lot: 3229827)</b>									
ES1328003-001	MB_MW05	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES1328079-004	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit



### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>ED037P: Alkalinity by PC Titrator (QCLot: 3225582)</b>									
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	----	200 mg/L	95.2	81	111	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3227256)</b>									
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	102	86	122	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3229847)</b>									
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	102	86	122	
<b>ED045G: Chloride Discrete analyser (QCLot: 3227255)</b>									
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	97.6	77	123	
<b>ED045G: Chloride Discrete analyser (QCLot: 3229845)</b>									
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	96.8	77	123	
<b>ED093F: Dissolved Major Cations (QCLot: 3227254)</b>									
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	87	113	
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	89	113	
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	101	79	113	
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	102	87	115	
<b>ED093F: Dissolved Major Cations (QCLot: 3229846)</b>									
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	106	87	113	
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	104	89	113	
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	110	79	113	
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	104	87	115	
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3230349)</b>									
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	94.7	80	118	
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	92.3	82	112	
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	90.1	81	111	
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	92.6	80	112	
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	88.0	83	111	
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	92.6	81	113	
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	93.0	81	113	
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	84.5	73	125	
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	92.6	80	116	
EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.1 mg/L	113	69	123	
<b>EG020T: Total Metals by ICP-MS (QCLot: 3230346)</b>									
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	96.8	79	121	
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	94.9	82	114	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EG020T: Total Metals by ICP-MS (QCLot: 3230346) - continued</b>									
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	96.4	83	115	
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	91.2	85	115	
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	94.1	83	115	
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	102	83	117	
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	86.3	68	128	
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	92.3	76	118	
EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	0.1 mg/L	82.9	73	127	
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3230351)</b>									
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	92.2	78	114	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3227571)</b>									
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	109	77	115	
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3229115)</b>									
EG051G: Ferrous Iron	----	0.10	mg/L	<0.10	2.00 mg/L	109	89	113	
<b>EK040P: Fluoride by PC Titrator (QCLot: 3225583)</b>									
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5.0 mg/L	95.6	75	119	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3227506)</b>									
EP066: Total Polychlorinated biphenyls	----	1	µg/L	<1	10 µg/L	83.0	61.6	107	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3229766)</b>									
EP074: Styrene	100-42-5	5	µg/L	<5	10 µg/L	98.4	74	118	
EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	10 µg/L	104	75	121	
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	10 µg/L	104	67	123	
EP074: 1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	10 µg/L	104	70	122	
EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	10 µg/L	107	69	123	
EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	10 µg/L	103	71	121	
EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	10 µg/L	103	70	122	
EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	10 µg/L	107	67	123	
EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	10 µg/L	108	62	126	
<b>EP074B: Oxygenated Compounds (QCLot: 3229766)</b>									
EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	100 µg/L	101	61.4	134	
EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	100 µg/L	105	73.6	130	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	100 µg/L	104	61	139	
EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	100 µg/L	101	65	137	
<b>EP074C: Sulfonated Compounds (QCLot: 3229766)</b>									
EP074: Carbon disulfide	75-15-0	5	µg/L	<5	10 µg/L	78.3	72.8	127	
<b>EP074D: Fumigants (QCLot: 3229766)</b>									
EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	10 µg/L	102	61	119	
EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	10 µg/L	108	76	120	
EP074: cis-1,3-Dichloropropylene	10061-01-5	10	µg/L	<10	10 µg/L	90.0	62	120	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074D: Fumigants (QCLot: 3229766) - continued</b>									
EP074: trans-1,3-Dichloropropylene	10061-02-6	10	µg/L	<10	10 µg/L	86.1	61	119	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	10 µg/L	102	69	117	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3229766)</b>									
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	100 µg/L	79.1	60.6	138	
EP074: Chloromethane	74-87-3	50	µg/L	<50	100 µg/L	88.2	67.4	130	
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	100 µg/L	113	69.4	129	
EP074: Bromomethane	74-83-9	50	µg/L	<50	100 µg/L	96.8	56	140	
EP074: Chloroethane	75-00-3	50	µg/L	<50	100 µg/L	99.2	63	135	
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	100 µg/L	105	65	131	
EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	10 µg/L	104	69	123	
EP074: Iodomethane	74-88-4	5	µg/L	<5	10 µg/L	85.4	70.2	128	
EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	10 µg/L	103	71	119	
EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	10 µg/L	106	75	119	
EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	10 µg/L	104	77	117	
EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	10 µg/L	101	61	119	
EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	10 µg/L	109	73	119	
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	10 µg/L	95.6	63	121	
EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	10 µg/L	113	78	122	
EP074: Trichloroethene	79-01-6	5	µg/L	<5	10 µg/L	107	74	120	
EP074: Dibromomethane	74-95-3	5	µg/L	<5	10 µg/L	106	74	118	
EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	10 µg/L	112	75	123	
EP074: 1,3-Dichloropropane	142-28-9	5	µg/L	<5	10 µg/L	110	79	121	
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	10 µg/L	111	72	124	
EP074: 1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	10 µg/L	92.0	66	114	
EP074: trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	10 µg/L	95.4	60	120	
EP074: cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	10 µg/L	91.9	70.6	128	
EP074: 1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	10 µg/L	101	70	124	
EP074: 1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	10 µg/L	112	74	128	
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	10 µg/L	81.6	71.8	126	
EP074: 1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	10 µg/L	83.6	66.4	136	
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	10 µg/L	114	58	132	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3229766)</b>									
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	10 µg/L	108	80	118	
EP074: Bromobenzene	108-86-1	5	µg/L	<5	10 µg/L	104	76	116	
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	10 µg/L	106	71	121	
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	10 µg/L	106	71	121	
EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	10 µg/L	108	74	120	
EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	10 µg/L	110	72	120	
EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	10 µg/L	109	77	117	





Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3229766) - continued</b>									
EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	10 µg/L	108	60	126	
EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	10 µg/L	113	67	125	
<b>EP074G: Trihalomethanes (QCLot: 3229766)</b>									
EP074: Chloroform	67-66-3	5	µg/L	<5	10 µg/L	109	76	118	
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	10 µg/L	93.5	64	118	
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	10 µg/L	90.3	65	115	
EP074: Bromoform	75-25-2	5	µg/L	<5	10 µg/L	92.8	73.5	126	
<b>EP074H: Naphthalene (QCLot: 3229766)</b>									
EP074: Naphthalene	91-20-3	7	µg/L	<7	10 µg/L	113	61	125	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3227508)</b>									
EP075(SIM): Phenol	108-95-2	0.2	µg/L	----	5 µg/L	36.8	24.5	61.9	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Chlorophenol	95-57-8	0.2	µg/L	----	5 µg/L	67.4	63.8	110	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2-Methylphenol	95-48-7	0.2	µg/L	----	5 µg/L	68.6	55.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	0.4	µg/L	----	10 µg/L	59.8	42.5	114	
		2	µg/L	<2.0	----	----	----	----	
EP075(SIM): 2-Nitrophenol	88-75-5	0.2	µg/L	----	5 µg/L	69.0	62.7	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.2	µg/L	----	5 µg/L	63.2	59.9	112	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.2	µg/L	----	5 µg/L	67.4	59.3	122	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.2	µg/L	----	5 µg/L	96.0	64.3	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.2	µg/L	----	5 µg/L	64.5	63	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.2	µg/L	----	5 µg/L	75.6	58.7	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.2	µg/L	----	5 µg/L	76.4	50	108	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Pentachlorophenol	87-86-5	0.4	µg/L	----	10 µg/L	81.7	8.7	95	
		2	µg/L	<2.0	----	----	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3227508)</b>									
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	5 µg/L	63.3	58.6	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	5 µg/L	73.5	63.6	114	
		1	µg/L	<1.0	----	----	----	----	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike	Spike Recovery (%)	Recovery Limits (%)	
					Concentration	LCS	Low	High
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3227508) - continued</b>								
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	5 µg/L	69.4	62.2	113
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	5 µg/L	74.3	63.9	115
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	5 µg/L	92.4	62.6	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	5 µg/L	112	64.3	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	5 µg/L	106	63.6	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	5 µg/L	103	63.1	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	5 µg/L	97.8	64.1	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	5 µg/L	102	62.5	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	5 µg/L	91.9	61.7	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	5 µg/L	95.6	61.7	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	5 µg/L	92.4	63.3	117
		0.5	µg/L	<0.5	----	----	----	----
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	5 µg/L	93.4	59.9	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	----	5 µg/L	95.2	61.2	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	----	5 µg/L	99.3	59.1	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	1	µg/L	<1.0	----	----	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3227507)</b>								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	90.5	59	129
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	105	71	131
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	83.4	62	120
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229767)</b>								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	108	75	127
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229827)</b>								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	77.8	75	127
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3227507)</b>								
EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	2500 µg/L	74.3	58.9	131



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3227507) - continued</b>									
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	103	73.9	138	
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----	
		50	µg/L	----	1500 µg/L	80.3	67	127	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229767)</b>									
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	111	75	127	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229827)</b>									
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	80.3	75	127	
<b>EP080: BTEXN (QCLot: 3229767)</b>									
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	107	70	124	
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	106	65	129	
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	100	70	120	
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	101	69	121	
	106-42-3								
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	102	72	122	
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	115	70	124	
<b>EP080: BTEXN (QCLot: 3229827)</b>									
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	101	70	124	
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	89.1	65	129	
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	97.0	70	120	
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	90.4	69	121	
	106-42-3								
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	89.9	72	122	
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	91.1	70	124	

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report				
				Spike Concentration	Spike Recovery(%)		Recovery Limits (%)	
					MS	Low	High	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3227256)</b>								
ES1327989-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3229847)</b>								
ES1327849-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130	
<b>ED045G: Chloride Discrete analyser (QCLot: 3227255)</b>								



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>ED045G: Chloride Discrete analyser (QCLot: 3227255) - continued</b>							
ES1327989-002	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	94.4	70	130
<b>ED045G: Chloride Discrete analyser (QCLot: 3229845)</b>							
ES1327849-002	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	96.2	70	130
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3230349)</b>							
ES1327960-001	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	109	70	130
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	102	70	130
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	95.4	70	130
		EG020A-F: Copper	7440-50-8	0.2 mg/L	104	70	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	95.2	70	130
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	95.4	70	130
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	98.9	70	130
EG020A-F: Zinc	7440-66-6	0.2 mg/L	110	70	130		
<b>EG020T: Total Metals by ICP-MS (QCLot: 3230346)</b>							
ES1327960-002	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	110	70	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	115	70	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	111	70	130
		EG020A-T: Lead	7439-92-1	1 mg/L	116	70	130
		EG020A-T: Manganese	7439-96-5	1 mg/L	117	70	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	117	70	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	110	70	130
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3230351)</b>							
ES1328003-002	ML_MW08	EG035F: Mercury	7439-97-6	0.0100 mg/L	84.0	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3227571)</b>							
ES1328003-007	RB01_181213CF	EG035T: Mercury	7439-97-6	0.010 mg/L	81.6	70	130
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3229115)</b>							
ES1328000-004	Anonymous	EG051G: Ferrous Iron	---	1.00 mg/L	# Not Determined	68	128
<b>EK040P: Fluoride by PC Titrator (QCLot: 3225583)</b>							
ES1328002-004	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	95.2	70	130
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3229766)</b>							
ES1327988-002	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	25 µg/L	108	70	130
		EP074: Trichloroethene	79-01-6	25 µg/L	126	70	130
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3229766)</b>							
ES1327988-002	Anonymous	EP074: Chlorobenzene	108-90-7	25 µg/L	124	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229767)</b>							
ES1327988-002	Anonymous	EP080: C6 - C9 Fraction	---	325 µg/L	124	70	130



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report				
				Spike	SpikeRecovery(%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3229827)</b>								
ES1328003-001	MB_MW05	EP080: C6 - C9 Fraction	----	325 µg/L	97.8	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229767)</b>								
ES1327988-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	125	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3229827)</b>								
ES1328003-001	MB_MW05	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	98.3	70	130	
<b>EP080: BTEXN (QCLot: 3229767)</b>								
ES1327988-002	Anonymous	EP080: Benzene	71-43-2	25 µg/L	109	70	130	
		EP080: Toluene	108-88-3	25 µg/L	111	70	130	
		EP080: Ethylbenzene	100-41-4	25 µg/L	117	70	130	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	118	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	25 µg/L	119	70	130	
	EP080: Naphthalene	91-20-3	25 µg/L	125	70	130		
<b>EP080: BTEXN (QCLot: 3229827)</b>								
ES1328003-001	MB_MW05	EP080: Benzene	71-43-2	25 µg/L	97.4	70	130	
		EP080: Toluene	108-88-3	25 µg/L	97.5	70	130	
		EP080: Ethylbenzene	100-41-4	25 µg/L	110	70	130	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	107	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	25 µg/L	103	70	130	
	EP080: Naphthalene	91-20-3	25 µg/L	90.5	70	130		

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
<b>EK040P: Fluoride by PC Titrator (QCLot: 3225583)</b>										
ES1328002-004	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	95.2	----	70	130	----	----
<b>ED045G: Chloride Discrete analyser (QCLot: 3227255)</b>										
ES1327989-002	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	94.4	----	70	130	----	----
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3227256)</b>										
ES1327989-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3227571)</b>										





Sub-Matrix: WATER

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3229847) - continued</b>										
ES1327849-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	----	70	130	----	----
<b>EG020T: Total Metals by ICP-MS (QCLot: 3230346)</b>										
ES1327960-002	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	110	----	70	130	----	----
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	115	----	70	130	----	----
		EG020A-T: Chromium	7440-47-3	1 mg/L	111	----	70	130	----	----
		EG020A-T: Lead	7439-92-1	1 mg/L	116	----	70	130	----	----
		EG020A-T: Manganese	7439-96-5	1 mg/L	117	----	70	130	----	----
		EG020A-T: Nickel	7440-02-0	1 mg/L	117	----	70	130	----	----
		EG020A-T: Zinc	7440-66-6	1 mg/L	110	----	70	130	----	----
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 3230349)</b>										
ES1327960-001	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	109	----	70	130	----	----
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	102	----	70	130	----	----
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	95.4	----	70	130	----	----
		EG020A-F: Copper	7440-50-8	0.2 mg/L	104	----	70	130	----	----
		EG020A-F: Lead	7439-92-1	0.2 mg/L	95.2	----	70	130	----	----
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	95.4	----	70	130	----	----
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	98.9	----	70	130	----	----
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	110	----	70	130	----	----
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3230351)</b>										
ES1328003-002	ML_MW08	EG035F: Mercury	7439-97-6	0.0100 mg/L	84.0	----	70	130	----	----



## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1328003</b>	Page	: 1 of 9
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: SYMPHONY DELTA WEST	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 20-DEC-2013
C-O-C number	: ----	Issue Date	: 03-JAN-2014
Sampler	: ----	No. of samples received	: 7
Order number	: 0207420/0207423	No. of samples analysed	: 7
Quote number	: SY/551/13 V4		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>ED037P: Alkalinity by PC Titrator</b>							
<b>Clear Plastic Bottle - Natural (ED037-P)</b> MB_MW05, ML_MW08, MB_MW02, ME_MW04, MB_MW03, MF_MW03	18-DEC-2013	---	01-JAN-2014	----	21-DEC-2013	01-JAN-2014	✓
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>							
<b>Clear Plastic Bottle - Natural (ED041G)</b> MB_MW02, ME_MW04, MB_MW03, MF_MW03	18-DEC-2013	---	15-JAN-2014	----	23-DEC-2013	15-JAN-2014	✓
<b>Clear Plastic Bottle - Natural (ED041G)</b> MB_MW05, ML_MW08	18-DEC-2013	---	15-JAN-2014	----	24-DEC-2013	15-JAN-2014	✓
<b>ED045G: Chloride Discrete analyser</b>							
<b>Clear Plastic Bottle - Natural (ED045G)</b> MB_MW02, ME_MW04, MB_MW03, MF_MW03	18-DEC-2013	---	15-JAN-2014	----	23-DEC-2013	15-JAN-2014	✓
<b>Clear Plastic Bottle - Natural (ED045G)</b> MB_MW05, ML_MW08	18-DEC-2013	---	15-JAN-2014	----	24-DEC-2013	15-JAN-2014	✓
<b>ED093F: Dissolved Major Cations</b>							
<b>Clear Plastic Bottle - Natural (ED093F)</b> MB_MW02, ME_MW04, MB_MW03, MF_MW03	18-DEC-2013	---	25-DEC-2013	----	23-DEC-2013	25-DEC-2013	✓
<b>Clear Plastic Bottle - Natural (ED093F)</b> MB_MW05, ML_MW08	18-DEC-2013	---	25-DEC-2013	----	24-DEC-2013	25-DEC-2013	✓
<b>EG020F: Dissolved Metals by ICP-MS</b>							
<b>Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)</b> MB_MW05, ML_MW08, MB_MW02, ME_MW04, MB_MW03, MF_MW03	18-DEC-2013	---	16-JUN-2014	----	27-DEC-2013	16-JUN-2014	✓
<b>EG020T: Total Metals by ICP-MS</b>							
<b>Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)</b> RB01_181213CF	18-DEC-2013	27-DEC-2013	16-JUN-2014	✓	27-DEC-2013	16-JUN-2014	✓



Matrix: **WATER** Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EG035F: Dissolved Mercury by FIMS</b>							
<b>Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)</b> MB_MW05, ML_MW08, MB_MW02, ME_MW04, MB_MW03, MF_MW03	18-DEC-2013	---	15-JAN-2014	----	27-DEC-2013	15-JAN-2014	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>							
<b>Clear Plastic Bottle - Unfiltered; Lab-acidified (EG035T)</b> RB01_181213CF	18-DEC-2013	----	----	----	24-DEC-2013	15-JAN-2014	✓
<b>EG051G: Ferrous Iron by Discrete Analyser</b>							
<b>Clear Plastic Bottle - HCl - Filtered (EG051G)</b> MB_MW05, ML_MW08, MB_MW02, ME_MW04, MB_MW03, MF_MW03	18-DEC-2013	----	----	----	24-DEC-2013	25-DEC-2013	✓
<b>EK040P: Fluoride by PC Titrator</b>							
<b>Clear Plastic Bottle - Natural (EK040P)</b> MB_MW05, ML_MW08, MB_MW02, ME_MW04, MB_MW03, MF_MW03	18-DEC-2013	---	15-JAN-2014	----	21-DEC-2013	15-JAN-2014	✓
<b>EP066: Polychlorinated Biphenyls (PCB)</b>							
<b>Amber Glass Bottle - Unpreserved (EP066)</b> ML_MW08	18-DEC-2013	23-DEC-2013	25-DEC-2013	✓	02-JAN-2014	09-FEB-2014	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>							
<b>Amber Glass Bottle - Unpreserved (EP071)</b> MB_MW05, ML_MW08, MB_MW02, ME_MW04, MB_MW03, MF_MW03, RB01_181213CF	18-DEC-2013	23-DEC-2013	25-DEC-2013	✓	02-JAN-2014	09-FEB-2014	✓
<b>EP074D: Fumigants</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> ML_MW08	18-DEC-2013	28-DEC-2013	01-JAN-2014	✓	28-DEC-2013	01-JAN-2014	✓
<b>EP074E: Halogenated Aliphatic Compounds</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> ML_MW08	18-DEC-2013	28-DEC-2013	01-JAN-2014	✓	28-DEC-2013	01-JAN-2014	✓
<b>EP074F: Halogenated Aromatic Compounds</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> ML_MW08	18-DEC-2013	28-DEC-2013	01-JAN-2014	✓	28-DEC-2013	01-JAN-2014	✓
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> ML_MW08	18-DEC-2013	28-DEC-2013	01-JAN-2014	✓	28-DEC-2013	01-JAN-2014	✓
<b>EP074H: Naphthalene</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> ML_MW08	18-DEC-2013	28-DEC-2013	01-JAN-2014	✓	28-DEC-2013	01-JAN-2014	✓



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP074B: Oxygenated Compounds</b>							
Amber VOC Vial - Sulfuric Acid (EP074) ML_MW08	18-DEC-2013	28-DEC-2013	01-JAN-2014	✓	28-DEC-2013	01-JAN-2014	✓
<b>EP074C: Sulfonated Compounds</b>							
Amber VOC Vial - Sulfuric Acid (EP074) ML_MW08	18-DEC-2013	28-DEC-2013	01-JAN-2014	✓	28-DEC-2013	01-JAN-2014	✓
<b>EP074G: Trihalomethanes</b>							
Amber VOC Vial - Sulfuric Acid (EP074) ML_MW08	18-DEC-2013	28-DEC-2013	01-JAN-2014	✓	28-DEC-2013	01-JAN-2014	✓
<b>EP075(SIM)A: Phenolic Compounds</b>							
Amber Glass Bottle - Unpreserved (EP075(SIM)) MB_MW05, ML_MW08, MB_MW02, ME_MW04, MB_MW03, MF_MW03, RB01_181213CF	18-DEC-2013	23-DEC-2013	25-DEC-2013	✓	02-JAN-2014	09-FEB-2014	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>							
Amber Glass Bottle - Unpreserved (EP075(SIM)) MB_MW05, ML_MW08, MB_MW02, ME_MW04, MB_MW03, MF_MW03, RB01_181213CF	18-DEC-2013	23-DEC-2013	25-DEC-2013	✓	02-JAN-2014	09-FEB-2014	✓
<b>EP080: BTEXN</b>							
Amber VOC Vial - Sulfuric Acid (EP080) MB_MW05, ML_MW08, MB_MW02, ME_MW04, MB_MW03, MF_MW03, RB01_181213CF	18-DEC-2013	28-DEC-2013	01-JAN-2014	✓	28-DEC-2013	01-JAN-2014	✓
<b>EP080/071: Total Petroleum Hydrocarbons</b>							
Amber VOC Vial - Sulfuric Acid (EP080) MB_MW05, ML_MW08, MB_MW02, ME_MW04, MB_MW03, MF_MW03, RB01_181213CF	18-DEC-2013	28-DEC-2013	01-JAN-2014	✓	28-DEC-2013	01-JAN-2014	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Alkalinity by PC Titrator	ED037-P	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	4	39	10.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	6	16.7	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	2	18	11.1	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	4	40	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	39	10.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	17	11.8	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	2	15	13.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	4	38	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	18	11.1	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
Alkalinity by PC Titrator	ED037-P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	4	39	10.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	6	16.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	16	6.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	4	25.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	39	5.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	15	6.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	38	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
Chloride by Discrete Analyser	ED045G	2	39	5.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	6	16.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	16	6.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



Matrix: **WATER** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Method Blanks (MB) - Continued</b>							
Polychlorinated Biphenyls (PCB)	EP066	1	4	25.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	39	5.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	15	6.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	38	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
Chloride by Discrete Analyser	ED045G	2	39	5.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	6	16.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	39	5.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	15	6.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	38	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Sulfate (Turbidimetric) as SO <sub>4</sub> <sup>2-</sup> by Discrete Analyser	ED041G	WATER	APHA 21st ed., 4500-SO <sub>4</sub> Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> <sup>2-</sup> concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Chloride by Discrete Analyser	ED045G	WATER	APHA 21st ed., 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	Major Cations is determined based on APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um filtered sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Hardness parameters are calculated based on APHA 21st ed., 2340 B. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): Samples are 0.45 um filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) Samples are 0.45 um filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)





Analytical Methods	Method	Matrix	Method Descriptions
Total Mercury by FIMS	EG035T	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Ferrous Iron by Discrete Analyser	EG051G	WATER	APHA 21st ed., 3500 Fe-B. A colorimetric determination based on the reaction between phenanthroline and ferrous iron at pH 3.2-3.3 to form an orange-red complex that is measured against a five-point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Fluoride by PC Titrator	EK040P	WATER	APHA 21st ed., 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by Turbi SO4 by DA. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Polychlorinated Biphenyls (PCB)	EP066	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
TPH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Volatile Organic Compounds	EP074	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
TPH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals	EN25	WATER	USEPA SW846-3005 Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Lab Acidification of Metals	EN80	WATER	USEPA Method 200.8
Lab Acidification of Dissolved Metals	EN80F	WATER	US EPA Method 200.8
Separatory Funnel Extraction of Liquids	ORG14	WATER	USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.



## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Matrix Spike (MS) Recoveries</b>							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	ES1327849-002	Anonymous	Sulfate as SO4 - Turbidimetric	14808-79-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	ES1327989-002	Anonymous	Sulfate as SO4 - Turbidimetric	14808-79-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG051G: Ferrous Iron by Discrete Analyser	ES1328000-004	Anonymous	Ferrous Iron	----	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.

#### Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- No Analysis Holding Time Outliers exist.

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

<b>Work Order</b> : <b>ES1328003</b>	
<b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b> : Environmental Division Sydney
<b>Contact</b> : MR JONATHAN LEKAWSKI	<b>Contact</b> : Barbara Hanna
<b>Address</b> : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b> : jonathan.lekawski@erm.com	<b>E-mail</b> : Barbara.Hanna@alsglobal.com
<b>Telephone</b> : +61 02 8584 8888	<b>Telephone</b> : +61 2 8784 8555
<b>Facsimile</b> : +61 02 8584 8800	<b>Facsimile</b> : +61 2 8784 8555
<b>Project</b> : SYMPHONY DELTA WEST	<b>Page</b> : 1 of 3
<b>Order number</b> : 0207420/0207423	<b>Quote number</b> : ES2013ENVRES0360 (SY/551/13 V4)
<b>C-O-C number</b> : ----	<b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b> : ----	
<b>Sampler</b> : ----	

#### Dates

<b>Date Samples Received</b> : 20-DEC-2013	<b>Issue Date</b> : 21-DEC-2013 09:29
<b>Client Requested Due Date</b> : 03-JAN-2014	<b>Scheduled Reporting Date</b> : <b>03-JAN-2014</b>

#### Delivery Details

<b>Mode of Delivery</b> : Carrier	<b>Temperature</b> : 5.1°C - Ice present
<b>No. of coolers/boxes</b> : 7 HARD	<b>No. of samples received</b> : 7
<b>Security Seal</b> : Intact.	<b>No. of samples analysed</b> : 7

#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

### Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EG020F Dissolved Metals by ICPMS	WATER - EG051G Ferrous Iron by Discrete Analyser	WATER - EK040-P Fluoride(PC)	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP066-PCB-WA Polychlorinated Biphenyls (PCB)	WATER - EP074 (water) Volatile Organic Compounds	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
ES1328003-001	18-DEC-2013 16:30	MB_MW05	✓	✓	✓	✓			✓	✓
ES1328003-002	18-DEC-2013 15:25	ML_MW08	✓	✓	✓	✓	✓	✓	✓	✓
ES1328003-003	18-DEC-2013 14:06	MB_MW02	✓	✓	✓	✓			✓	✓
ES1328003-004	18-DEC-2013 11:52	ME_MW04	✓	✓	✓	✓			✓	✓
ES1328003-005	18-DEC-2013 10:39	MB_MW03	✓	✓	✓	✓			✓	✓
ES1328003-006	18-DEC-2013 09:13	MF_MW03	✓	✓	✓	✓			✓	✓

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - W-02 8 Metals	WATER - W-02T 8 metals (Total)	WATER - W-24 TPH/BTEX/PAH/Phenols	WATER - W-24 TPH/BTEX/PAH/Phenols
ES1328003-001	18-DEC-2013 16:30	MB_MW05	✓			✓
ES1328003-002	18-DEC-2013 15:25	ML_MW08	✓			✓
ES1328003-003	18-DEC-2013 14:06	MB_MW02	✓			✓
ES1328003-004	18-DEC-2013 11:52	ME_MW04	✓			✓
ES1328003-005	18-DEC-2013 10:39	MB_MW03	✓			✓
ES1328003-006	18-DEC-2013 09:13	MF_MW03	✓			✓
ES1328003-007	18-DEC-2013 15:00	RB01_181213CF		✓	✓	

### Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV ) Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA ) Email jonathan.lekawski@erm.com  
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI ) Email jonathan.lekawski@erm.com  
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC ) Email jonathan.lekawski@erm.com  
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN ) Email jonathan.lekawski@erm.com  
- Chain of Custody (CoC) ( COC ) Email jonathan.lekawski@erm.com  
- EDI Format - ENMRG ( ENMRG ) Email jonathan.lekawski@erm.com  
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM ) Email jonathan.lekawski@erm.com  
- EDI Format - ESDAT ( ESDAT ) Email jonathan.lekawski@erm.com  
- EDI Format - XTab ( XTAB ) Email jonathan.lekawski@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA ) Email symphony.deltawest@erm.com  
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI ) Email symphony.deltawest@erm.com  
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC ) Email symphony.deltawest@erm.com  
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN ) Email symphony.deltawest@erm.com  
- A4 - AU Tax Invoice ( INV ) Email symphony.deltawest@erm.com  
- Chain of Custody (CoC) ( COC ) Email symphony.deltawest@erm.com  
- EDI Format - ENMRG ( ENMRG ) Email symphony.deltawest@erm.com  
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM ) Email symphony.deltawest@erm.com  
- EDI Format - ESDAT ( ESDAT ) Email symphony.deltawest@erm.com

### SYMPHONY ERARING

- \*AU Certificate of Analysis - NATA ( COA ) Email Symphony.Eraring@erm.com  
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI ) Email Symphony.Eraring@erm.com  
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC ) Email Symphony.Eraring@erm.com  
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN ) Email Symphony.Eraring@erm.com  
- A4 - AU Tax Invoice ( INV ) Email Symphony.Eraring@erm.com  
- Chain of Custody (CoC) ( COC ) Email Symphony.Eraring@erm.com  
- EDI Format - ENMRG ( ENMRG ) Email Symphony.Eraring@erm.com  
- EDI Format - ESDAT ( ESDAT ) Email Symphony.Eraring@erm.com  
- EDI Format - XTab ( XTAB ) Email Symphony.Eraring@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV ) Email au.accounts@erm.com



**CHAIN OF CUSTODY**  
ALS Laboratory  
Phase 102-3

2011-2012 11 pages, 2nd Edition, 01-01-2011  
 2012-2013 11 pages, 3rd Edition, 01-01-2012  
 2013-2014 11 pages, 4th Edition, 01-01-2013  
 2014-2015 11 pages, 5th Edition, 01-01-2014  
 2015-2016 11 pages, 6th Edition, 01-01-2015  
 2016-2017 11 pages, 7th Edition, 01-01-2016  
 2017-2018 11 pages, 8th Edition, 01-01-2017  
 2018-2019 11 pages, 9th Edition, 01-01-2018  
 2019-2020 11 pages, 10th Edition, 01-01-2019  
 2020-2021 11 pages, 11th Edition, 01-01-2020  
 2021-2022 11 pages, 12th Edition, 01-01-2021  
 2022-2023 11 pages, 13th Edition, 01-01-2022  
 2023-2024 11 pages, 14th Edition, 01-01-2023  
 2024-2025 11 pages, 15th Edition, 01-01-2024

2025-2026 11 pages, 16th Edition, 01-01-2025  
 2026-2027 11 pages, 17th Edition, 01-01-2026  
 2027-2028 11 pages, 18th Edition, 01-01-2027  
 2028-2029 11 pages, 19th Edition, 01-01-2028  
 2029-2030 11 pages, 20th Edition, 01-01-2029  
 2030-2031 11 pages, 21st Edition, 01-01-2030  
 2031-2032 11 pages, 22nd Edition, 01-01-2031  
 2032-2033 11 pages, 23rd Edition, 01-01-2032  
 2033-2034 11 pages, 24th Edition, 01-01-2033  
 2034-2035 11 pages, 25th Edition, 01-01-2034

2035-2036 11 pages, 26th Edition, 01-01-2035  
 2036-2037 11 pages, 27th Edition, 01-01-2036  
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 2039-2040 11 pages, 30th Edition, 01-01-2039  
 2040-2041 11 pages, 31st Edition, 01-01-2040  
 2041-2042 11 pages, 32nd Edition, 01-01-2041  
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 2046-2047 11 pages, 37th Edition, 01-01-2046  
 2047-2048 11 pages, 38th Edition, 01-01-2047  
 2048-2049 11 pages, 39th Edition, 01-01-2048  
 2049-2050 11 pages, 40th Edition, 01-01-2049  
 2050-2051 11 pages, 41st Edition, 01-01-2050  
 2051-2052 11 pages, 42nd Edition, 01-01-2051  
 2052-2053 11 pages, 43rd Edition, 01-01-2052  
 2053-2054 11 pages, 44th Edition, 01-01-2053  
 2054-2055 11 pages, 45th Edition, 01-01-2054

**CLIENT:** ERM  
**OFFICE:** GROUND FLOOR, 33 BAUNDERS ST, PYRMONT NSW 2009  
**PROJECT:** Symphony - Data View  
**ORDER NUMBER:** 0201449090743  
**PROJECT MANAGER:** Jonathan Labarek  
**SAMPLES:** C, Ford  
**QC:** emailed to ALS | YBS / 109  
**QC REPORTS:** to Will default to PM if no other addresses are listed; Symphony, DataView@erm.com  
**EMAIL:** Invoiced to Will default to PM if no other addresses are listed; Symphony, DataView@erm.com  
**COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:**

**TURNAROUND REQUIREMENTS:**  
 Standard TAT may be longer for some tests e.g. UPL Data Generated  
 A9 QUOTE NO. SYDNEY VA  
 Standard TAT (list due date)  
 Non Standard or Urgent TAT (list due date)

**COINTEGRATION (CITIS) CONTAINER INFORMATION:**  
**ANALYSIS REQUIRED INCLUDING SUTTS (NB SUTTS Codes must be listed to attract sale price) Where Mobile and required, specify Total (unfilled) bottle required) or Dissolved (field filled) bottle required.**

**RELINQUISHED BY:** Chris Ford  
**DATE/TIME:** 18.12.13  
**RECEIVED BY:** Steven  
**DATE/TIME:** 20.12.13 8:30  
**COCC REQUESTER NUMBER (circle):**  
 CDD: 1 2 3 4 0 0 7  
 DR: 1 2 3 4 0 0 7  
**RELINQUISHED BY:**  
**DATE/TIME:**  
**RECEIVED BY:**  
**DATE/TIME:**

LAB ID	SAMPLE ID	DATE / TIME	SUTTS	TYPE & PRESERVATIVE CODES (below)	(refer to)	TOTAL CONTAINERS	W-4 (TPH/TEH (C6-C36) or 40) BTEXH	8 Ultra Trace Dissolved Metals (As, Cd, Cr, Co, Ni, Pb, Zn, Hg) -	Additional Metals Ultra Trace - Se, Br, F, Mn	Ferrous Iron	PAH/Phenols	VOC Scan	PCB	Colours/Anions	Additional Information
1	MB-MW05	18-12-13 / 1630	W			7	✓	✓	✓	✓	✓	✓	✓	✓	
2	ML-MW08	18-12-13 / 1625	W			7	✓	✓	✓	✓	✓	✓	✓	✓	
3	MB-MW02	18-12-13 / 1406	W			7	✓	✓	✓	✓	✓	✓	✓	✓	
4	ME-MW04	18-12-13 / 1152	W			7	✓	✓	✓	✓	✓	✓	✓	✓	
5	MB-MW03	18-12-13 / 1039	W			7	✓	✓	✓	✓	✓	✓	✓	✓	
6	ME-MW03	18-12-13 / 0913	W			7	✓	✓	✓	✓	✓	✓	✓	✓	
7	RBD1-BD13CF	18-12-13	W			4	✓	✓	✓	✓	✓	✓	✓	✓	

Environmental Division  
 Sydney  
 Work Order  
**ES1328003**



Telephone : + 61-2-8784 8555

When Container Codes: P = Unpreserved Plastic, N = Nitric Preserved Plastic, ORG = Nitric Preserved Plastic, SH = Sodium Hydroxide Preserved Plastic, AS = Amber Glass Unpreserved, AB = Airtight Unpreserved Plastic, V = VOA Vial Preserved, VB = VOA Vial Sodium Disulphate Preserved, VS = VOA Vial Multiple Preserved, AV = Airtight Unpreserved Vial, SG = Sulphur Preserved Amber Glass, H = HCl Preserved Plastic, HB = HCl Preserved Speciation Bottle, SP = Sulphur  
 Z = Zinc Acetate Preserved Bottle, B = EDTA Preserved Bottle, ST = Stereo Bottle, ASB = Plastic Bag for Acid Sulphate Solts, B = Unpreserved Bag.

## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>ES1328041</b> <b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : SYMPHONY DELTAWEST <b>Address</b> : GRND FLOOR, 33 SAUNDERS STREET PYRMONT NSW AUSTRALIA 2009  <b>E-mail</b> : symphony.deltawest@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800 <b>Project</b> : SYMPHONY-DELTA WEST <b>Order number</b> : 0207423 <b>C-O-C number</b> : ---- <b>Sampler</b> : TS <b>Site</b> : ----  <b>Quote number</b> : SY/551/13 V4	<b>Page</b> : 1 of 17  <b>Laboratory</b> : Environmental Division Sydney <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164  <b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555 <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement  <b>Date Samples Received</b> : 19-DEC-2013 <b>Issue Date</b> : 06-JAN-2014  <b>No. of samples received</b> : 11 <b>No. of samples analysed</b> : 11
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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Organics
Raymond Commodor	Instrument Chemist	Sydney Inorganics





## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EG020: Analysis on sample ES1328041 # 009 was not conducted as sample was not received.**
- **EG020: Positive Copper result for sample ES1328041 #008 has been confirmed by re-digestion and re-analysis.**
- **EP080: Sample TRIP SPIKE contains volatile compounds spiked into the sample containers prior to dispatch from the laboratory. BTEX compounds spiked at 20 ug/L.**



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MC-MW03	MC-MW04	MD-MW01	MD-MW03	D01_171213_TS
				17-DEC-2013 08:29	17-DEC-2013 09:27	17-DEC-2013 10:40	17-DEC-2013 11:55	17-DEC-2013 11:55
Compound	CAS Number	LOR	Unit	ES1328041-001	ES1328041-002	ES1328041-003	ES1328041-004	ES1328041-005
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	317	148	102	72	73
Total Alkalinity as CaCO3	----	1	mg/L	317	148	102	72	73
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	173	178	84	192	190
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	27	27	13	145	146
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	70	52	32	19	19
Magnesium	7439-95-4	1	mg/L	57	25	10	6	6
Sodium	7440-23-5	1	mg/L	38	54	32	176	176
Potassium	7440-09-7	1	mg/L	29	22	15	3	3
<b>EG020F: Dissolved Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	----	----	0.001	----	----
Cadmium	7440-43-9	0.0001	mg/L	----	----	<0.0001	----	----
Chromium	7440-47-3	0.001	mg/L	----	----	<0.001	----	----
Copper	7440-50-8	0.001	mg/L	----	----	<0.001	----	----
Lead	7439-92-1	0.001	mg/L	----	----	<0.001	----	----
Manganese	7439-96-5	0.001	mg/L	----	----	1.45	----	----
Nickel	7440-02-0	0.001	mg/L	----	----	0.005	----	----
Selenium	7782-49-2	0.01	mg/L	----	----	<0.01	----	----
Zinc	7440-66-6	0.005	mg/L	----	----	0.014	----	----
Boron	7440-42-8	0.05	mg/L	----	----	0.11	----	----
<b>EG035F: Dissolved Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
<b>EG051G: Ferrous Iron by Discrete Analyser</b>								
Ferrous Iron	----	0.05	mg/L	0.76	2.85	4.40	8.80	----
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS</b>								
Selenium	7782-49-2	0.2	µg/L	<0.2	<0.2	----	1.1	1.1
Arsenic	7440-38-2	0.2	µg/L	3.4	104	----	5.9	5.7
Boron	7440-42-8	5	µg/L	41	46	----	17	17
Cadmium	7440-43-9	0.05	µg/L	<0.05	0.55	----	0.13	0.13



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MC-MW03	MC-MW04	MD-MW01	MD-MW03	D01_171213_TS
				17-DEC-2013 08:29	17-DEC-2013 09:27	17-DEC-2013 10:40	17-DEC-2013 11:55	17-DEC-2013 11:55
Compound	CAS Number	LOR	Unit	ES1328041-001	ES1328041-002	ES1328041-003	ES1328041-004	ES1328041-005
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS - Continued</b>								
Chromium	7440-47-3	0.2	µg/L	<0.2	<0.2	----	2.9	2.9
Copper	7440-50-8	0.5	µg/L	1.1	0.6	----	1.0	1.0
Lead	7439-92-1	0.1	µg/L	0.1	<0.1	----	16.4	17.2
Manganese	7439-96-5	0.5	µg/L	9130	1100	----	616	598
Nickel	7440-02-0	0.5	µg/L	112	83.2	----	40.6	40.6
Zinc	7440-66-6	1	µg/L	26	32	----	104	105
<b>EK040P: Fluoride by PC Titrator</b>								
Fluoride	16984-48-8	0.1	mg/L	0.2	0.2	0.1	0.1	0.1
<b>EN055: Ionic Balance</b>								
Total Anions	----	0.01	meq/L	10.7	7.42	4.15	9.53	9.53
Total Cations	----	0.01	meq/L	10.6	7.56	4.20	9.17	9.17
Ionic Balance	----	0.01	%	0.56	0.93	0.50	1.91	1.94
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	1	µg/L	<1	<1	----	----	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	5	µg/L	<5	<5	<5	<5	<5
Isopropylbenzene	98-82-8	5	µg/L	<5	<5	<5	<5	<5
n-Propylbenzene	103-65-1	5	µg/L	<5	<5	<5	<5	<5
1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	<5	<5	<5
sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	<5	<5	<5
1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	<5	<5	<5
tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	<5	<5	<5
p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	<5	<5	<5
n-Butylbenzene	104-51-8	5	µg/L	<5	<5	<5	<5	<5
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	50	µg/L	<50	<50	<50	<50	<50
2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	<50	<50	<50
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	<50	<50	<50
2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	<50	<50	<50
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	5	µg/L	<5	<5	<5	<5	<5
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	<5	<5	<5



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MC-MW03	MC-MW04	MD-MW01	MD-MW03	D01_171213_TS
				17-DEC-2013 08:29	17-DEC-2013 09:27	17-DEC-2013 10:40	17-DEC-2013 11:55	17-DEC-2013 11:55
Compound	CAS Number	LOR	Unit	ES1328041-001	ES1328041-002	ES1328041-003	ES1328041-004	ES1328041-005
<b>EP074D: Fumigants - Continued</b>								
1.2-Dichloropropane	78-87-5	5	µg/L	<5	<5	<5	<5	<5
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	<5	<5	<5
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	<5	<5	<5
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	<5	<5	<5
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	<50	<50	<50
Chloromethane	74-87-3	50	µg/L	<50	<50	<50	<50	<50
Vinyl chloride	75-01-4	50	µg/L	<50	<50	<50	<50	<50
Bromomethane	74-83-9	50	µg/L	<50	<50	<50	<50	<50
Chloroethane	75-00-3	50	µg/L	<50	<50	<50	<50	<50
Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	<50	<50	<50
1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	<5	<5	<5
Iodomethane	74-88-4	5	µg/L	<5	<5	<5	<5	<5
trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	<5	<5	<5
1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	<5	<5	<5
cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	<5	<5	<5
1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	<5	<5	<5
1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	<5	<5	<5
Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	<5	<5	<5
1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	<5	<5	<5
Trichloroethene	79-01-6	5	µg/L	<5	<5	<5	<5	<5
Dibromomethane	74-95-3	5	µg/L	<5	<5	<5	<5	<5
1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	<5	<5	<5
1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	<5	<5	<5
Tetrachloroethene	127-18-4	5	µg/L	<5	<5	<5	<5	<5
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	<5	<5	<5
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	<5	<5	<5
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	<5	<5	<5
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	<5	<5	<5
1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	<5	<5	<5
Pentachloroethane	76-01-7	5	µg/L	<5	<5	<5	<5	<5
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	<5	<5	<5
Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	<5	<5	<5



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MC-MW03	MC-MW04	MD-MW01	MD-MW03	D01_171213_TS
				17-DEC-2013 08:29	17-DEC-2013 09:27	17-DEC-2013 10:40	17-DEC-2013 11:55	17-DEC-2013 11:55
Compound	CAS Number	LOR	Unit	ES1328041-001	ES1328041-002	ES1328041-003	ES1328041-004	ES1328041-005
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	5	µg/L	<5	<5	<5	<5	<5
Bromobenzene	108-86-1	5	µg/L	<5	<5	<5	<5	<5
2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	<5	<5	<5
4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	<5	<5	<5
1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	<5	<5	<5
1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	<5	<5	<5
1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	<5	<5	<5
1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	<5	<5	<5
1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	<5	<5	<5
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	5	µg/L	<5	<5	<5	<5	<5
Bromodichloromethane	75-27-4	5	µg/L	<5	<5	<5	<5	<5
Dibromochloromethane	124-48-1	5	µg/L	<5	<5	<5	<5	<5
Bromoform	75-25-2	5	µg/L	<5	<5	<5	<5	<5
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	7	µg/L	<7	<7	<7	<7	<7
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MC-MW03	MC-MW04	MD-MW01	MD-MW03	D01_171213_TS
				17-DEC-2013 08:29	17-DEC-2013 09:27	17-DEC-2013 10:40	17-DEC-2013 11:55	17-DEC-2013 11:55
Compound	CAS Number	LOR	Unit	ES1328041-001	ES1328041-002	ES1328041-003	ES1328041-004	ES1328041-005
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MC-MW03	MC-MW04	MD-MW01	MD-MW03	D01_171213_TS
				17-DEC-2013 08:29	17-DEC-2013 09:27	17-DEC-2013 10:40	17-DEC-2013 11:55	17-DEC-2013 11:55
Compound	CAS Number	LOR	Unit	ES1328041-001	ES1328041-002	ES1328041-003	ES1328041-004	ES1328041-005
<b>EP080: BTEXN - Continued</b>								
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	63.4	61.2	----	----	----
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	128	124	125	123	133
Toluene-D8	2037-26-5	0.1	%	125	120	121	115	126
4-Bromofluorobenzene	460-00-4	0.1	%	112	107	108	103	112
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	19.1	14.1	24.4	18.0	22.7
2-Chlorophenol-D4	93951-73-6	0.1	%	38.6	28.8	51.6	36.5	46.3
2,4,6-Tribromophenol	118-79-6	0.1	%	58.2	38.7	66.6	60.6	67.6
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	49.6	33.9	51.1	39.0	45.9
Anthracene-d10	1719-06-8	0.1	%	61.0	46.0	73.2	59.2	66.4
4-Terphenyl-d14	1718-51-0	0.1	%	62.4	44.0	77.4	59.0	64.1
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	113	110	111	110	118
Toluene-D8	2037-26-5	0.1	%	116	112	112	107	117
4-Bromofluorobenzene	460-00-4	0.1	%	103	98.8	98.4	94.7	102





## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MD_MW04	MK_MW07	R01_161213	R01_171213	TB5
				17-DEC-2013 14:15	17-DEC-2013 15:15	16-DEC-2013 15:00	17-DEC-2013 15:00	17-DEC-2013 15:00
Compound	CAS Number	LOR	Unit	ES1328041-006	ES1328041-007	ES1328041-008	ES1328041-009	ES1328041-010
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	114	62	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	114	62	----	----	----
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	45	86	----	----	----
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	6	24	----	----	----
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	15	20	----	----	----
Magnesium	7439-95-4	1	mg/L	15	9	----	----	----
Sodium	7440-23-5	1	mg/L	29	38	----	----	----
Potassium	7440-09-7	1	mg/L	10	7	----	----	----
<b>EG020F: Dissolved Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	0.041	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Manganese	7439-96-5	0.001	mg/L	1.21	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	0.048	----	----	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	0.007	----	----	----	----
Boron	7440-42-8	0.05	mg/L	<0.05	----	----	----	----
<b>EG020T: Total Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	----	----	<0.001	----	----
Cadmium	7440-43-9	0.0001	mg/L	----	----	<0.0001	----	----
Chromium	7440-47-3	0.001	mg/L	----	----	<0.001	----	----
Copper	7440-50-8	0.001	mg/L	----	----	0.001	----	----
Lead	7439-92-1	0.001	mg/L	----	----	<0.001	----	----
Nickel	7440-02-0	0.001	mg/L	----	----	<0.001	----	----
Zinc	7440-66-6	0.005	mg/L	----	----	<0.005	----	----
<b>EG035F: Dissolved Mercury by FIMS</b>								



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MD_MW04	MK_MW07	R01_161213	R01_171213	TB5
				17-DEC-2013 14:15	17-DEC-2013 15:15	16-DEC-2013 15:00	17-DEC-2013 15:00	17-DEC-2013 15:00
Compound	CAS Number	LOR	Unit	ES1328041-006	ES1328041-007	ES1328041-008	ES1328041-009	ES1328041-010
<b>EG035F: Dissolved Mercury by FIMS - Continued</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	----	----	----
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	----	----	<0.0001	----	----
<b>EG051G: Ferrous Iron by Discrete Analyser</b>								
Ferrous Iron	----	0.05	mg/L	<b>3.09</b>	<b>0.06</b>	----	----	----
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS</b>								
Selenium	7782-49-2	0.2	µg/L	----	<b>0.2</b>	----	----	----
Arsenic	7440-38-2	0.2	µg/L	----	<b>0.4</b>	----	----	----
Boron	7440-42-8	5	µg/L	----	<b>17</b>	----	----	----
Cadmium	7440-43-9	0.05	µg/L	----	<b>0.11</b>	----	----	----
Chromium	7440-47-3	0.2	µg/L	----	<b>0.2</b>	----	----	----
Copper	7440-50-8	0.5	µg/L	----	<b>0.6</b>	----	----	----
Lead	7439-92-1	0.1	µg/L	----	<b>40.3</b>	----	----	----
Manganese	7439-96-5	0.5	µg/L	----	<b>1440</b>	----	----	----
Nickel	7440-02-0	0.5	µg/L	----	<b>52.5</b>	----	----	----
Zinc	7440-66-6	1	µg/L	----	<b>102</b>	----	----	----
<b>EK040P: Fluoride by PC Titrator</b>								
Fluoride	16984-48-8	0.1	mg/L	<b>0.3</b>	<0.1	----	----	----
<b>EN055: Ionic Balance</b>								
Total Anions	----	0.01	meq/L	<b>3.38</b>	<b>3.71</b>	----	----	----
Total Cations	----	0.01	meq/L	<b>3.50</b>	<b>3.57</b>	----	----	----
Ionic Balance	----	0.01	%	<b>1.67</b>	<b>1.87</b>	----	----	----
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	1	µg/L	----	<1	----	----	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	5	µg/L	<5	<5	----	----	----
Isopropylbenzene	98-82-8	5	µg/L	<5	<5	----	----	----
n-Propylbenzene	103-65-1	5	µg/L	<5	<5	----	----	----
1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	----	----	----
sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	----	----	----
1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	----	----	----
tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	----	----	----
p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	----	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

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				MD_MW04	MK_MW07	R01_161213	R01_171213	TB5
				17-DEC-2013 14:15	17-DEC-2013 15:15	16-DEC-2013 15:00	17-DEC-2013 15:00	17-DEC-2013 15:00
Compound	CAS Number	LOR	Unit	ES1328041-006	ES1328041-007	ES1328041-008	ES1328041-009	ES1328041-010
<b>EP074A: Monocyclic Aromatic Hydrocarbons - Continued</b>								
n-Butylbenzene	104-51-8	5	µg/L	<5	<5	----	----	----
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	50	µg/L	<50	<50	----	----	----
2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	----	----	----
2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	----	----	----
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	5	µg/L	<5	<5	----	----	----
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	----	----	----
1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	----	----	----
cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	----	----	----
trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	----	----	----
1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	----	----	----
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	----	----	----
Chloromethane	74-87-3	50	µg/L	<50	<50	----	----	----
Vinyl chloride	75-01-4	50	µg/L	<50	<50	----	----	----
Bromomethane	74-83-9	50	µg/L	<50	<50	----	----	----
Chloroethane	75-00-3	50	µg/L	<50	<50	----	----	----
Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	----	----	----
1,1-Dichloroethene	75-35-4	5	µg/L	<5	<5	----	----	----
Iodomethane	74-88-4	5	µg/L	<5	<5	----	----	----
trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	<5	----	----	----
1,1-Dichloroethane	75-34-3	5	µg/L	<5	<5	----	----	----
cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	<5	----	----	----
1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	<5	----	----	----
1,1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	----	----	----
Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	----	----	----
1,2-Dichloroethane	107-06-2	5	µg/L	<5	<5	----	----	----
Trichloroethene	79-01-6	5	µg/L	<5	<5	----	----	----
Dibromomethane	74-95-3	5	µg/L	<5	<5	----	----	----
1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	<5	----	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MD_MW04	MK_MW07	R01_161213	R01_171213	TB5
				17-DEC-2013 14:15	17-DEC-2013 15:15	16-DEC-2013 15:00	17-DEC-2013 15:00	17-DEC-2013 15:00
Compound	CAS Number	LOR	Unit	ES1328041-006	ES1328041-007	ES1328041-008	ES1328041-009	ES1328041-010
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
1,3-Dichloropropane	142-28-9	5	µg/L	<5	<5	----	----	----
Tetrachloroethene	127-18-4	5	µg/L	<5	<5	----	----	----
1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	----	----	----
trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	----	----	----
cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	----	----	----
1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	----	----	----
1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	<5	----	----	----
Pentachloroethane	76-01-7	5	µg/L	<5	<5	----	----	----
1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	----	----	----
Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	----	----	----
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	5	µg/L	<5	<5	----	----	----
Bromobenzene	108-86-1	5	µg/L	<5	<5	----	----	----
2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	----	----	----
4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	----	----	----
1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	----	----	----
1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	----	----	----
1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	----	----	----
1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	----	----	----
1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	----	----	----
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	5	µg/L	<5	<5	----	----	----
Bromodichloromethane	75-27-4	5	µg/L	<5	<5	----	----	----
Dibromochloromethane	124-48-1	5	µg/L	<5	<5	----	----	----
Bromoform	75-25-2	5	µg/L	<5	<5	----	----	----
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	7	µg/L	<7	<7	----	----	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	----
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				MD_MW04	MK_MW07	R01_161213	R01_171213	TB5
				17-DEC-2013 14:15	17-DEC-2013 15:15	16-DEC-2013 15:00	17-DEC-2013 15:00	17-DEC-2013 15:00
Compound	CAS Number	LOR	Unit	ES1328041-006	ES1328041-007	ES1328041-008	ES1328041-009	ES1328041-010
<b>EP075(SIM)A: Phenolic Compounds - Continued</b>								
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				MD_MW04	MK_MW07	R01_161213	R01_171213	TB5
				17-DEC-2013 14:15	17-DEC-2013 15:15	16-DEC-2013 15:00	17-DEC-2013 15:00	17-DEC-2013 15:00
Compound	CAS Number	LOR	Unit	ES1328041-006	ES1328041-007	ES1328041-008	ES1328041-009	ES1328041-010
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 - Continued</b>								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	<100	<100	----
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	----
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	----	63.9	----	----	----
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	124	127	----	----	----
Toluene-D8	2037-26-5	0.1	%	123	120	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	107	107	----	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	21.4	23.0	22.2	19.3	----
2-Chlorophenol-D4	93951-73-6	0.1	%	48.2	49.5	42.9	39.8	----
2,4,6-Tribromophenol	118-79-6	0.1	%	57.0	46.1	50.4	41.1	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	46.4	47.1	45.6	40.3	----
Anthracene-d10	1719-06-8	0.1	%	62.3	63.0	57.8	54.3	----
4-Terphenyl-d14	1718-51-0	0.1	%	60.2	67.3	59.7	54.9	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	110	113	108	114	113



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sample ID	MD_MW04	MK_MW07	R01_161213	R01_171213	TB5
Client sampling date / time	17-DEC-2013 14:15	17-DEC-2013 15:15	16-DEC-2013 15:00	17-DEC-2013 15:00	17-DEC-2013 15:00
Compound	ES1328041-006	ES1328041-007	ES1328041-008	ES1328041-009	ES1328041-010

Compound	CAS Number	LOR	Unit	ES1328041-006	ES1328041-007	ES1328041-008	ES1328041-009	ES1328041-010
<b>EP080S: TPH(V)/BTEX Surrogates - Continued</b>								
Toluene-D8	2037-26-5	0.1	%	114	111	94.5	115	106
4-Bromofluorobenzene	460-00-4	0.1	%	99.2	97.8	90.4	99.1	96.4





## Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Client sample ID

				TS5	----	----	----	----
				17-DEC-2013 15:00	----	----	----	----
				ES1328041-011	----	----	----	----
Compound	CAS Number	LOR	Unit					
<b>EP080: BTEXN</b>								
Benzene	71-43-2	1	µg/L	18	----	----	----	----
Toluene	108-88-3	2	µg/L	17	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	16	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	16	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	17	----	----	----	----
^ Total Xylenes	1330-20-7	2	µg/L	33	----	----	----	----
^ Sum of BTEX	----	1	µg/L	84	----	----	----	----
Naphthalene	91-20-3	5	µg/L	20	----	----	----	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	113	----	----	----	----
Toluene-D8	2037-26-5	0.1	%	111	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	105	----	----	----	----



## Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP066S: PCB Surrogate</b>			
Decachlorobiphenyl	2051-24-3	28.5	129
<b>EP074S: VOC Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	78.3	133.2
Toluene-D8	2037-26-5	79.1	128.9
4-Bromofluorobenzene	460-00-4	80.8	123.7
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	10.0	44
2-Chlorophenol-D4	93951-73-6	14	94
2,4,6-Tribromophenol	118-79-6	17	125
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27.4	113
4-Terphenyl-d14	1718-51-0	32	112
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: ES1328041</b>	<b>Page</b>	: 1 of 18
<b>Client</b>	<b>: ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	<b>: SYMPHONY DELTAWEST</b>	<b>Contact</b>	: Barbara Hanna
<b>Address</b>	<b>: GRND FLOOR, 33 SAUNDERS STREET PYRMONT NSW AUSTRALIA 2009</b>	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	<b>: symphony.deltawest@erm.com</b>	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	<b>: +61 02 8584 8888</b>	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	<b>: +61 02 8584 8800</b>	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	<b>: SYMPHONY-DELTA WEST</b>	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b>	<b>: ----</b>	<b>Date Samples Received</b>	: 19-DEC-2013
<b>C-O-C number</b>	<b>: ----</b>	<b>Issue Date</b>	: 06-JAN-2014
<b>Sampler</b>	<b>: TS</b>	<b>No. of samples received</b>	: 11
<b>Order number</b>	<b>: 0207423</b>	<b>No. of samples analysed</b>	: 11
<b>Quote number</b>	<b>: SY/551/13 V4</b>		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Organics
Raymond Commodor	Instrument Chemist	Sydney Inorganics



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### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :            Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
                  CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
                  LOR = Limit of reporting  
                  RPD = Relative Percentage Difference  
                  # = Indicates failed QC



### Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>ED037P: Alkalinity by PC Titrator (QC Lot: 3225582)</b>									
ES1328000-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	356	354	0.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	356	354	0.5	0% - 20%
ES1328002-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	196	196	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	196	196	0.0	0% - 20%
<b>ED037P: Alkalinity by PC Titrator (QC Lot: 3225584)</b>									
ES1328012-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	32	32	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	32	32	0.0	0% - 20%
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3227256)</b>									
ES1327989-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	108	107	0.0	0% - 20%
ES1328003-005	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	160	161	0.9	0% - 20%
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3229847)</b>									
ES1327849-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	68	67	0.0	0% - 20%
ES1328100-008	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	220	237	7.5	0% - 20%
<b>ED045G: Chloride Discrete analyser (QC Lot: 3227255)</b>									
ES1327989-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	100	97	3.0	0% - 20%
ES1328003-005	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	34	32	8.0	0% - 20%
<b>ED045G: Chloride Discrete analyser (QC Lot: 3229845)</b>									
ES1327849-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	12	11	0.0	0% - 50%
ES1328100-008	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	420	420	0.0	0% - 20%
<b>ED093F: Dissolved Major Cations (QC Lot: 3227254)</b>									
ES1327989-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	21	21	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	25	25	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	78	78	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	8	8	0.0	No Limit
ES1328003-006	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	17	16	0.0	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	13	13	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	33	33	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	6	6	0.0	No Limit
<b>ED093F: Dissolved Major Cations (QC Lot: 3229846)</b>									



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>ED093F: Dissolved Major Cations (QC Lot: 3229846) - continued</b>									
ES1328116-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	14	11	21.6	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	10	9	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	528	461	13.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	5	4	25.5	No Limit
ES1328190-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	47	47	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	13	13	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	4	4	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	4	4	0.0	No Limit
<b>EG020T: Total Metals by ICP-MS (QC Lot: 3225860)</b>									
ES1327732-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.007	0.007	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.306	0.329	7.1	0% - 20%
ES1327935-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.0142	0.0138	2.7	0% - 50%
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.116	0.111	5.0	0% - 50%
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.096	0.093	3.6	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.666	0.664	0.3	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.694	0.673	3.0	0% - 20%
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	2.46	2.24	9.6	0% - 20%
<b>EG035F: Dissolved Mercury by FIMS (QC Lot: 3225664)</b>									
ES1327850-007	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1327930-008	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3228806)</b>									
ES1327849-007	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
<b>EG051G: Ferrous Iron by Discrete Analyser (QC Lot: 3225725)</b>									
ES1327849-001	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	0.86	0.88	2.6	0% - 50%
<b>EG051G: Ferrous Iron by Discrete Analyser (QC Lot: 3229115)</b>									
ES1328000-004	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	16.7	16.7	0.06	0% - 20%
ES1328002-003	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	3.04	3.03	0.4	0% - 20%
<b>EG051G: Ferrous Iron by Discrete Analyser (QC Lot: 3229116)</b>									
ES1328041-007	MK_MW07	EG051G: Ferrous Iron	----	0.05	mg/L	0.06	0.07	0.0	No Limit
ES1328198-004	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	0.09	0.09	0.0	No Limit
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 3228350)</b>									
ES1327849-003	Anonymous	EG094A-F: Cadmium	7440-43-9	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EG094A-F: Lead	7439-92-1	0.1	µg/L	0.6	0.6	0.0	No Limit
		EG094A-F: Arsenic	7440-38-2	0.2	µg/L	0.4	0.4	0.0	No Limit
		EG094A-F: Chromium	7440-47-3	0.2	µg/L	<0.2	<0.2	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 3228350) - continued</b>									
ES1327849-003	Anonymous	EG094A-F: Copper	7440-50-8	0.5	µg/L	2.5	2.5	0.0	No Limit
		EG094A-F: Manganese	7439-96-5	0.5	µg/L	1220	1190	1.9	0% - 20%
		EG094A-F: Nickel	7440-02-0	0.5	µg/L	35.7	35.4	0.7	0% - 20%
		EG094A-F: Zinc	7440-66-6	1	µg/L	56	56	0.0	0% - 20%
		EG094A-F: Boron	7440-42-8	5	µg/L	21	21	0.0	No Limit
ES1327850-007	Anonymous	EG094A-F: Cadmium	7440-43-9	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EG094A-F: Lead	7439-92-1	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG094A-F: Arsenic	7440-38-2	0.2	µg/L	0.7	0.7	0.0	No Limit
		EG094A-F: Chromium	7440-47-3	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG094A-F: Copper	7440-50-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG094A-F: Manganese	7439-96-5	0.5	µg/L	705	709	0.6	0% - 20%
		EG094A-F: Nickel	7440-02-0	0.5	µg/L	4.1	4.1	0.0	No Limit
		EG094A-F: Zinc	7440-66-6	1	µg/L	4	4	0.0	No Limit
EG094A-F: Boron	7440-42-8	5	µg/L	23	24	0.0	No Limit		
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 3228351)</b>									
ES1327849-003	Anonymous	EG094B-F: Selenium	7782-49-2	0.2	µg/L	<0.2	<0.2	0.0	No Limit
ES1327850-007	Anonymous	EG094B-F: Selenium	7782-49-2	0.2	µg/L	<0.2	<0.2	0.0	No Limit
<b>EK040P: Fluoride by PC Titrator (QC Lot: 3225583)</b>									
ES1328002-004	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
ES1328012-001	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3226330)</b>									
ES1327866-001	Anonymous	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
ES1328041-005	D01_171213_TS	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
<b>EP074B: Oxygenated Compounds (QC Lot: 3226330)</b>									





Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074B: Oxygenated Compounds (QC Lot: 3226330) - continued</b>									
ES1327866-001	Anonymous	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
ES1328041-005	D01_171213_TS	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
<b>EP074C: Sulfonated Compounds (QC Lot: 3226330)</b>									
ES1327866-001	Anonymous	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
ES1328041-005	D01_171213_TS	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
<b>EP074D: Fumigants (QC Lot: 3226330)</b>									
ES1327866-001	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
ES1328041-005	D01_171213_TS	EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3226330)</b>									
ES1327866-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3226330) - continued</b>									
ES1327866-001	Anonymous	EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit		
ES1328041-005	D01_171213_TS	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit

**EP074F: Halogenated Aromatic Compounds (QC Lot: 3226330)**



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report							
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)		
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3226330) - continued</b>											
ES1327866-001	Anonymous	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit		
ES1328041-005	D01_171213_TS	EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit		
<b>EP074G: Trihalomethanes (QC Lot: 3226330)</b>	Anonymous	EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit		
		EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Chloroform	67-66-3	5	µg/L	5	<5	0.0	No Limit		
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit		
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit		
		ES1328041-005	D01_171213_TS	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
				EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
EP074: Dibromochloromethane	124-48-1			5	µg/L	<5	<5	0.0	No Limit		
EP074: Bromoform	75-25-2			5	µg/L	<5	<5	0.0	No Limit		
<b>EP074H: Naphthalene (QC Lot: 3226330)</b>											
ES1327866-001	Anonymous	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit		
ES1328041-005	D01_171213_TS	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit		
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3226331)</b>											
ES1327866-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit		
ES1328041-005	D01_171213_TS	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit		
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3226331)</b>											
ES1327866-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit		
ES1328041-005	D01_171213_TS	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit		
<b>EP080: BTEXN (QC Lot: 3226331)</b>											
ES1327866-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit		
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit		

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 Work Order : ES1328041  
 Client : ENVIRO RESOURCES MANAGEMENT  
 Project : SYMPHONY-DELTA WEST



Sub-Matrix: <b>WATER</b>				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP080: BTEXN (QC Lot: 3226331) - continued</b>									
ES1327866-001	Anonymous	EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES1328041-005	D01_171213_TS	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit



### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>ED037P: Alkalinity by PC Titrator (QCLot: 3225582)</b>									
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	----	200 mg/L	95.2	81	111	
<b>ED037P: Alkalinity by PC Titrator (QCLot: 3225584)</b>									
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	----	200 mg/L	102	81	111	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3227256)</b>									
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	102	86	122	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3229847)</b>									
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	102	86	122	
<b>ED045G: Chloride Discrete analyser (QCLot: 3227255)</b>									
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	97.6	77	123	
<b>ED045G: Chloride Discrete analyser (QCLot: 3229845)</b>									
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	96.8	77	123	
<b>ED093F: Dissolved Major Cations (QCLot: 3227254)</b>									
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	87	113	
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	89	113	
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	101	79	113	
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	102	87	115	
<b>ED093F: Dissolved Major Cations (QCLot: 3229846)</b>									
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	106	87	113	
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	104	89	113	
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	110	79	113	
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	104	87	115	
<b>EG020T: Total Metals by ICP-MS (QCLot: 3225860)</b>									
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	91.7	79	121	
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	88.8	82	114	
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.4	83	115	
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	90.2	85	115	
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	101	83	117	
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	88.5	76	118	
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3225664)</b>									
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	89.4	78	114	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3228806)</b>									
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	103	77	115	
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3225725)</b>									



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3225725) - continued</b>									
EG051G: Ferrous Iron	----	0.10	mg/L	<0.10	2.00 mg/L	104	89	113	
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3229115)</b>									
EG051G: Ferrous Iron	----	0.10	mg/L	<0.10	2.00 mg/L	109	89	113	
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3229116)</b>									
EG051G: Ferrous Iron	----	0.10	mg/L	<0.10	2.00 mg/L	101	89	113	
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3228350)</b>									
EG094A-F: Arsenic	7440-38-2	0.2	µg/L	<0.2	10 µg/L	97.2	75	129	
EG094A-F: Boron	7440-42-8	5	µg/L	<5	10 µg/L	108	79	129	
EG094A-F: Cadmium	7440-43-9	0.05	µg/L	<0.05	10 µg/L	96.8	78	112	
EG094A-F: Chromium	7440-47-3	0.2	µg/L	<0.2	10 µg/L	97.5	71	123	
EG094A-F: Copper	7440-50-8	0.5	µg/L	<0.5	10 µg/L	98.7	77	125	
EG094A-F: Lead	7439-92-1	0.1	µg/L	<0.1	10 µg/L	98.6	74	118	
EG094A-F: Manganese	7439-96-5	0.5	µg/L	<0.5	10 µg/L	97.5	79	119	
EG094A-F: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	104	72	128	
EG094A-F: Zinc	7440-66-6	1	µg/L	<1	10 µg/L	106	76	134	
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3228351)</b>									
EG094B-F: Selenium	7782-49-2	0.2	µg/L	<0.2	10 µg/L	107	75	125	
<b>EK040P: Fluoride by PC Titrator (QCLot: 3225583)</b>									
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5.0 mg/L	95.6	75	119	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3227171)</b>									
EP066: Total Polychlorinated biphenyls	----	1	µg/L	<1	10 µg/L	83.3	61.6	107	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3226330)</b>									
EP074: Styrene	100-42-5	5	µg/L	<5	10 µg/L	83.7	74	118	
EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	10 µg/L	89.1	75	121	
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	10 µg/L	87.3	67	123	
EP074: 1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	10 µg/L	91.2	70	122	
EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	10 µg/L	91.9	69	123	
EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	10 µg/L	91.6	71	121	
EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	10 µg/L	89.2	70	122	
EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	10 µg/L	92.3	67	123	
EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	10 µg/L	91.0	62	126	
<b>EP074B: Oxygenated Compounds (QCLot: 3226330)</b>									
EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	100 µg/L	78.7	61.4	134	
EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	100 µg/L	83.7	73.6	130	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	100 µg/L	85.6	61	139	
EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	100 µg/L	88.9	65	137	
<b>EP074C: Sulfonated Compounds (QCLot: 3226330)</b>									
EP074: Carbon disulfide	75-15-0	5	µg/L	<5	10 µg/L	78.2	72.8	127	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074D: Fumigants (QCLot: 3226330)</b>									
EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	10 µg/L	89.9	61	119	
EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	10 µg/L	94.0	76	120	
EP074: cis-1,3-Dichloropropylene	10061-01-5	10	µg/L	<10	10 µg/L	75.4	62	120	
EP074: trans-1,3-Dichloropropylene	10061-02-6	10	µg/L	<10	10 µg/L	70.3	61	119	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	10 µg/L	90.0	69	117	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3226330)</b>									
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	100 µg/L	64.0	60.6	138	
EP074: Chloromethane	74-87-3	50	µg/L	<50	100 µg/L	70.1	67.4	130	
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	100 µg/L	113	69.4	129	
EP074: Bromomethane	74-83-9	50	µg/L	<50	100 µg/L	72.3	56	140	
EP074: Chloroethane	75-00-3	50	µg/L	<50	100 µg/L	84.4	63	135	
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	100 µg/L	93.9	65	131	
EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	10 µg/L	83.0	69	123	
EP074: Iodomethane	74-88-4	5	µg/L	<5	10 µg/L	85.8	70.2	128	
EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	10 µg/L	87.9	71	119	
EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	10 µg/L	93.1	75	119	
EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	10 µg/L	88.7	77	117	
EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	10 µg/L	93.5	61	119	
EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	10 µg/L	88.8	73	119	
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	10 µg/L	97.3	63	121	
EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	10 µg/L	98.9	78	122	
EP074: Trichloroethene	79-01-6	5	µg/L	<5	10 µg/L	92.1	74	120	
EP074: Dibromomethane	74-95-3	5	µg/L	<5	10 µg/L	97.3	74	118	
EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	10 µg/L	90.7	75	123	
EP074: 1,3-Dichloropropane	142-28-9	5	µg/L	<5	10 µg/L	92.8	79	121	
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	10 µg/L	92.4	72	124	
EP074: 1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	10 µg/L	95.9	66	114	
EP074: trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	10 µg/L	88.7	60	120	
EP074: cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	10 µg/L	86.3	70.6	128	
EP074: 1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	10 µg/L	95.6	70	124	
EP074: 1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	10 µg/L	103	74	128	
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	10 µg/L	94.9	71.8	126	
EP074: 1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	10 µg/L	87.4	66.4	136	
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	10 µg/L	115	58	132	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3226330)</b>									
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	10 µg/L	91.8	80	118	
EP074: Bromobenzene	108-86-1	5	µg/L	<5	10 µg/L	91.3	76	116	
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	10 µg/L	93.8	71	121	
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	10 µg/L	92.4	71	121	





Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
						LCS	Low	High
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3226330) - continued</b>								
EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	10 µg/L	94.4	74	120
EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	10 µg/L	94.8	72	120
EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	10 µg/L	93.5	77	117
EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	10 µg/L	95.6	60	126
EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	10 µg/L	101	67	125
<b>EP074G: Trihalomethanes (QCLot: 3226330)</b>								
EP074: Chloroform	67-66-3	5	µg/L	<5	10 µg/L	97.3	76	118
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	10 µg/L	97.8	64	118
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	10 µg/L	96.2	65	115
EP074: Bromoform	75-25-2	5	µg/L	<5	10 µg/L	104	73.5	126
<b>EP074H: Naphthalene (QCLot: 3226330)</b>								
EP074: Naphthalene	91-20-3	7	µg/L	<7	10 µg/L	97.4	61	125
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3227173)</b>								
EP075(SIM): Phenol	108-95-2	0.2	µg/L	----	5 µg/L	32.9	24.5	61.9
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2-Chlorophenol	95-57-8	0.2	µg/L	----	5 µg/L	# 61.1	63.8	110
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2-Methylphenol	95-48-7	0.2	µg/L	----	5 µg/L	66.7	55.9	112
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	0.4	µg/L	----	10 µg/L	62.4	42.5	114
		2	µg/L	<2.0	----	----	----	----
EP075(SIM): 2-Nitrophenol	88-75-5	0.2	µg/L	----	5 µg/L	79.6	62.7	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.2	µg/L	----	5 µg/L	81.7	59.9	112
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.2	µg/L	----	5 µg/L	71.3	59.3	122
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.2	µg/L	----	5 µg/L	90.6	64.3	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.2	µg/L	----	5 µg/L	73.7	63	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.2	µg/L	----	5 µg/L	76.8	58.7	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.2	µg/L	----	5 µg/L	90.8	50	108
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Pentachlorophenol	87-86-5	0.4	µg/L	----	10 µg/L	24.6	8.7	95
		2	µg/L	<2.0	----	----	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3227173)</b>								



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3227173) - continued</b>									
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	5 µg/L	75.7	58.6	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	5 µg/L	87.3	63.6	114	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	5 µg/L	83.4	62.2	113	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	5 µg/L	82.8	63.9	115	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	5 µg/L	90.1	62.6	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	5 µg/L	93.0	64.3	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	5 µg/L	92.7	63.6	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	5 µg/L	88.9	63.1	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	5 µg/L	83.8	64.1	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	5 µg/L	103	62.5	116	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	5 µg/L	81.9	61.7	119	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	5 µg/L	98.4	61.7	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	5 µg/L	94.2	63.3	117	
		0.5	µg/L	<0.5	----	----	----	----	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	5 µg/L	87.4	59.9	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	----	5 µg/L	91.4	61.2	117	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	----	5 µg/L	84.7	59.1	118	
		1	µg/L	<1.0	----	----	----	----	
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	1	µg/L	<1.0	----	----	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3226331)</b>									
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	84.1	75	127	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3227172)</b>									
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	84.7	59	129	
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	98.5	71	131	
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	78.8	62	120	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3226331)</b>									



Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit		Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3226331) - continued</b>								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	84.5	75	127
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3227172)</b>								
EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	2500 µg/L	82.9	58.9	131
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	95.5	73.9	138
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
		50	µg/L	----	1500 µg/L	80.5	67	127
<b>EP080: BTEXN (QCLot: 3226331)</b>								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	86.6	70	124
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	86.6	65	129
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	80.0	70	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	80.0	69	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	84.0	72	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	96.0	70	124

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: WATER				Matrix Spike (MS) Report			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%) Low High	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3227256)</b>							
ES1327989-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3229847)</b>							
ES1327849-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130
<b>ED045G: Chloride Discrete analyser (QCLot: 3227255)</b>							
ES1327989-002	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	94.4	70	130
<b>ED045G: Chloride Discrete analyser (QCLot: 3229845)</b>							
ES1327849-002	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	96.2	70	130
<b>EG020T: Total Metals by ICP-MS (QCLot: 3225860)</b>							
ES1327745-001	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	97.4	70	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	106	70	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	97.8	70	130
		EG020A-T: Lead	7439-92-1	1 mg/L	112	70	130



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report					
Laboratory sample ID		Client sample ID		Method: Compound	CAS Number	Spike Concentration	Spike Recovery(%) MS	Recovery Limits (%)	
								Low	High
<b>EG020T: Total Metals by ICP-MS (QCLot: 3225860) - continued</b>									
ES1327745-001	Anonymous		EG020A-T: Nickel	7440-02-0	1 mg/L	101	70	130	
			EG020A-T: Zinc	7440-66-6	1 mg/L	96.0	70	130	
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3225664)</b>									
ES1327850-007	Anonymous		EG035F: Mercury	7439-97-6	0.0100 mg/L	102	70	130	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3228806)</b>									
ES1327969-002	Anonymous		EG035T: Mercury	7439-97-6	0.010 mg/L	78.8	70	130	
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3225725)</b>									
ES1327849-001	Anonymous		EG051G: Ferrous Iron	----	1.00 mg/L	94.6	68	128	
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3229115)</b>									
ES1328000-004	Anonymous		EG051G: Ferrous Iron	----	1.00 mg/L	# Not Determined	68	128	
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3229116)</b>									
ES1328041-007	MK_MW07		EG051G: Ferrous Iron	----	1.00 mg/L	98.2	68	128	
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3228350)</b>									
ES1327849-006	Anonymous		EG094A-F: Arsenic	7440-38-2	50 µg/L	122	70	130	
			EG094A-F: Cadmium	7440-43-9	12.5 µg/L	101	70	130	
			EG094A-F: Chromium	7440-47-3	50 µg/L	103	70	130	
			EG094A-F: Copper	7440-50-8	50 µg/L	103	70	130	
			EG094A-F: Lead	7439-92-1	50 µg/L	101	70	130	
			EG094A-F: Manganese	7439-96-5	50 µg/L	# Not Determined	70	130	
			EG094A-F: Nickel	7440-02-0	50 µg/L	# Not Determined	70	130	
			EG094A-F: Zinc	7440-66-6	50 µg/L	# Not Determined	70	130	
<b>EK040P: Fluoride by PC Titrator (QCLot: 3225583)</b>									
ES1328002-004	Anonymous		EK040P: Fluoride	16984-48-8	5.0 mg/L	95.2	70	130	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3226330)</b>									
ES1327866-001	Anonymous		EP074: 1,1-Dichloroethene	75-35-4	25 µg/L	93.3	70	130	
			EP074: Trichloroethene	79-01-6	25 µg/L	105	70	130	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3226330)</b>									
ES1327866-001	Anonymous		EP074: Chlorobenzene	108-90-7	25 µg/L	107	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3226331)</b>									
ES1327866-001	Anonymous		EP080: C6 - C9 Fraction	----	325 µg/L	120	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3226331)</b>									
ES1327866-001	Anonymous								



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report				
				Spike	Spike Recovery(%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3226331) - continued</b>								
ES1327866-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	120	70	130	
<b>EP080: BTEXN (QCLot: 3226331)</b>								
ES1327866-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	97.2	70	130	
		EP080: Toluene	108-88-3	25 µg/L	99.1	70	130	
		EP080: Ethylbenzene	100-41-4	25 µg/L	99.4	70	130	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	97.4	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	25 µg/L	105	70	130	
	EP080: Naphthalene	91-20-3	25 µg/L	107	70	130		

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
<b>EK040P: Fluoride by PC Titrator (QCLot: 3225583)</b>										
ES1328002-004	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	95.2	----	70	130	----	----
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 3225664)</b>										
ES1327850-007	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	102	----	70	130	----	----
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3225725)</b>										
ES1327849-001	Anonymous	EG051G: Ferrous Iron	----	1.00 mg/L	94.6	----	68	128	----	----
<b>EG020T: Total Metals by ICP-MS (QCLot: 3225860)</b>										
ES1327745-001	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	97.4	----	70	130	----	----
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	106	----	70	130	----	----
		EG020A-T: Chromium	7440-47-3	1 mg/L	97.8	----	70	130	----	----
		EG020A-T: Lead	7439-92-1	1 mg/L	112	----	70	130	----	----
		EG020A-T: Nickel	7440-02-0	1 mg/L	101	----	70	130	----	----
		EG020A-T: Zinc	7440-66-6	1 mg/L	96.0	----	70	130	----	----
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3226330)</b>										
ES1327866-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	25 µg/L	93.3	----	70	130	----	----
		EP074: Trichloroethene	79-01-6	25 µg/L	105	----	70	130	----	----
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3226330)</b>										
ES1327866-001	Anonymous	EP074: Chlorobenzene	108-90-7	25 µg/L	107	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3226331)</b>										
ES1327866-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	120	----	70	130	----	----



Sub-Matrix: WATER

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3226331)</b>										
ES1327866-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	120	----	70	130	----	----
<b>EP080: BTEXN (QCLot: 3226331)</b>										
ES1327866-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	97.2	----	70	130	----	----
		EP080: Toluene	108-88-3	25 µg/L	99.1	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	25 µg/L	99.4	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	97.4	----	70	130	----	----
		EP080: ortho-Xylene	106-42-3	25 µg/L	105	----	70	130	----	----
		EP080: Naphthalene	95-47-6	25 µg/L	107	----	70	130	----	----
<b>ED045G: Chloride Discrete analyser (QCLot: 3227255)</b>										
ES1327989-002	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	94.4	----	70	130	----	----
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3227256)</b>										
ES1327989-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	----	70	130	----	----
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3228350)</b>										
ES1327849-006	Anonymous	EG094A-F: Arsenic	7440-38-2	50 µg/L	122	----	70	130	----	----
		EG094A-F: Cadmium	7440-43-9	12.5 µg/L	101	----	70	130	----	----
		EG094A-F: Chromium	7440-47-3	50 µg/L	103	----	70	130	----	----
		EG094A-F: Copper	7440-50-8	50 µg/L	103	----	70	130	----	----
		EG094A-F: Lead	7439-92-1	50 µg/L	101	----	70	130	----	----
		EG094A-F: Manganese	7439-96-5	50 µg/L	# Not Determined	----	70	130	----	----
		EG094A-F: Nickel	7440-02-0	50 µg/L	# Not Determined	----	70	130	----	----
		EG094A-F: Zinc	7440-66-6	50 µg/L	# Not Determined	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3228806)</b>										
ES1327969-002	Anonymous	EG035T: Mercury	7439-97-6	0.010 mg/L	78.8	----	70	130	----	----
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3229115)</b>										
ES1328000-004	Anonymous	EG051G: Ferrous Iron	----	1.00 mg/L	# Not Determined	----	68	128	----	----
<b>EG051G: Ferrous Iron by Discrete Analyser (QCLot: 3229116)</b>										
ES1328041-007	MK_MW07	EG051G: Ferrous Iron	----	1.00 mg/L	98.2	----	68	128	----	----
<b>ED045G: Chloride Discrete analyser (QCLot: 3229845)</b>										
ES1327849-002	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	96.2	----	70	130	----	----
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3229847)</b>										
ES1327849-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	----	70	130	----	----

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1328041</b>	Page	: 1 of 13
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: SYMPHONY DELTAWEST	Contact	: Barbara Hanna
Address	: GRND FLOOR, 33 SAUNDERS STREET PYRMONT NSW AUSTRALIA 2009	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: symphony.deltawest@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: SYMPHONY-DELTA WEST	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 19-DEC-2013
C-O-C number	: ----	Issue Date	: 06-JAN-2014
Sampler	: TS	No. of samples received	: 11
Order number	: 0207423	No. of samples analysed	: 11
Quote number	: SY/551/13 V4		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers





## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER** Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>ED037P: Alkalinity by PC Titrator</b>							
<b>Clear Plastic Bottle - Natural (ED037-P)</b> MC-MW03, MD-MW01, D01_171213_TS, MK_MW07 MC-MW04, MD-MW03, MD_MW04	17-DEC-2013	---	31-DEC-2013	----	21-DEC-2013	31-DEC-2013	✓
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>							
<b>Clear Plastic Bottle - Natural (ED041G)</b> MC-MW03, MD-MW01, D01_171213_TS, MK_MW07 MC-MW04, MD-MW03, MD_MW04	17-DEC-2013	---	14-JAN-2014	----	23-DEC-2013	14-JAN-2014	✓
<b>Clear Plastic Bottle - Natural (ED041G)</b> MK_MW07	17-DEC-2013	---	14-JAN-2014	----	24-DEC-2013	14-JAN-2014	✓
<b>ED045G: Chloride Discrete analyser</b>							
<b>Clear Plastic Bottle - Natural (ED045G)</b> MC-MW03, MD-MW01, D01_171213_TS, MK_MW07 MC-MW04, MD-MW03, MD_MW04	17-DEC-2013	---	14-JAN-2014	----	23-DEC-2013	14-JAN-2014	✓
<b>Clear Plastic Bottle - Natural (ED045G)</b> MK_MW07	17-DEC-2013	---	14-JAN-2014	----	24-DEC-2013	14-JAN-2014	✓
<b>ED093F: Dissolved Major Cations</b>							
<b>Clear Plastic Bottle - Natural (ED093F)</b> MC-MW03, MD-MW01, D01_171213_TS, MK_MW07 MC-MW04, MD-MW03, MD_MW04	17-DEC-2013	---	24-DEC-2013	----	23-DEC-2013	24-DEC-2013	✓
<b>Clear Plastic Bottle - Natural (ED093F)</b> MK_MW07	17-DEC-2013	---	24-DEC-2013	----	24-DEC-2013	24-DEC-2013	✓
<b>EG020F: Dissolved Metals by ICP-MS</b>							
<b>Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F)</b> MD-MW01, MD_MW04	17-DEC-2013	---	15-JUN-2014	----	22-DEC-2013	15-JUN-2014	✓
<b>EG020T: Total Metals by ICP-MS</b>							
<b>Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)</b> R01_161213	16-DEC-2013	23-DEC-2013	14-JUN-2014	✓	23-DEC-2013	14-JUN-2014	✓



Matrix: **WATER** Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EG035F: Dissolved Mercury by FIMS</b>							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG035F) MC-MW03, MD-MW03, MK_MW07 MC-MW04, D01_171213_TS,	17-DEC-2013	---	14-JAN-2014	----	23-DEC-2013	14-JAN-2014	✓
Clear Plastic Bottle - Filtered; Lab-acidified (EG035F) MD-MW01, MD_MW04	17-DEC-2013	---	14-JAN-2014	----	23-DEC-2013	14-JAN-2014	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG035T) R01_161213	16-DEC-2013	----	----	----	24-DEC-2013	13-JAN-2014	✓
<b>EG051G: Ferrous Iron by Discrete Analyser</b>							
Clear Plastic Bottle - HCl - Filtered (EG051G) MD_MW04, MK_MW07	17-DEC-2013	----	----	----	24-DEC-2013	24-DEC-2013	✓
Clear Plastic Bottle - Natural (EG051G) MC-MW03, MD-MW01, MC-MW04, MD-MW03	17-DEC-2013	----	----	----	22-DEC-2013	18-DEC-2013	*
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS</b>							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094A-F) MC-MW03, MD-MW03, MK_MW07 MC-MW04, D01_171213_TS,	17-DEC-2013	---	15-JUN-2014	----	24-DEC-2013	15-JUN-2014	✓
<b>EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS</b>							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094B-F) MC-MW03, MD-MW03, MK_MW07 MC-MW04, D01_171213_TS,	17-DEC-2013	---	15-JUN-2014	----	24-DEC-2013	15-JUN-2014	✓
<b>EK040P: Fluoride by PC Titrator</b>							
Clear Plastic Bottle - Natural (EK040P) MC-MW03, MD-MW01, D01_171213_TS, MK_MW07 MC-MW04, MD-MW03, MD_MW04,	17-DEC-2013	---	14-JAN-2014	----	21-DEC-2013	14-JAN-2014	✓
<b>EP066: Polychlorinated Biphenyls (PCB)</b>							
Amber Glass Bottle - Unpreserved (EP066) MC-MW03, MK_MW07 MC-MW04,	17-DEC-2013	23-DEC-2013	24-DEC-2013	✓	03-JAN-2014	12-FEB-2014	✓



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP080/071: Total Petroleum Hydrocarbons</b>							
<b>Amber Glass Bottle - Unpreserved (EP071)</b> R01_161213	16-DEC-2013	23-DEC-2013	23-DEC-2013	✓	03-JAN-2014	12-FEB-2014	✓
<b>Amber Glass Bottle - Unpreserved (EP071)</b> MC-MW03, MC-MW04, MD-MW01, MD-MW03, D01_171213_TS, MD_MW04, MK_MW07, R01_171213	17-DEC-2013	23-DEC-2013	24-DEC-2013	✓	03-JAN-2014	12-FEB-2014	✓
<b>EP074D: Fumigants</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> MC-MW03, MC-MW04, MD-MW01, MD-MW03, D01_171213_TS, MD_MW04, MK_MW07	17-DEC-2013	23-DEC-2013	31-DEC-2013	✓	23-DEC-2013	31-DEC-2013	✓
<b>EP074E: Halogenated Aliphatic Compounds</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> MC-MW03, MC-MW04, MD-MW01, MD-MW03, D01_171213_TS, MD_MW04, MK_MW07	17-DEC-2013	23-DEC-2013	31-DEC-2013	✓	23-DEC-2013	31-DEC-2013	✓
<b>EP074F: Halogenated Aromatic Compounds</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> MC-MW03, MC-MW04, MD-MW01, MD-MW03, D01_171213_TS, MD_MW04, MK_MW07	17-DEC-2013	23-DEC-2013	31-DEC-2013	✓	23-DEC-2013	31-DEC-2013	✓
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> MC-MW03, MC-MW04, MD-MW01, MD-MW03, D01_171213_TS, MD_MW04, MK_MW07	17-DEC-2013	23-DEC-2013	31-DEC-2013	✓	23-DEC-2013	31-DEC-2013	✓
<b>EP074H: Naphthalene</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> MC-MW03, MC-MW04, MD-MW01, MD-MW03, D01_171213_TS, MD_MW04, MK_MW07	17-DEC-2013	23-DEC-2013	31-DEC-2013	✓	23-DEC-2013	31-DEC-2013	✓



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP074B: Oxygenated Compounds</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> MC-MW03, MD-MW01, D01_171213_TS, MK_MW07	MC-MW04, MD-MW03, MD_MW04,	17-DEC-2013	23-DEC-2013	31-DEC-2013	✓	23-DEC-2013	31-DEC-2013	✓
<b>EP074C: Sulfonated Compounds</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> MC-MW03, MD-MW01, D01_171213_TS, MK_MW07	MC-MW04, MD-MW03, MD_MW04,	17-DEC-2013	23-DEC-2013	31-DEC-2013	✓	23-DEC-2013	31-DEC-2013	✓
<b>EP074G: Trihalomethanes</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP074)</b> MC-MW03, MD-MW01, D01_171213_TS, MK_MW07	MC-MW04, MD-MW03, MD_MW04,	17-DEC-2013	23-DEC-2013	31-DEC-2013	✓	23-DEC-2013	31-DEC-2013	✓
<b>EP075(SIM)A: Phenolic Compounds</b>								
<b>Amber Glass Bottle - Unpreserved (EP075(SIM))</b> R01_161213		16-DEC-2013	23-DEC-2013	23-DEC-2013	✓	03-JAN-2014	12-FEB-2014	✓
<b>Amber Glass Bottle - Unpreserved (EP075(SIM))</b> MC-MW03, MD-MW01, D01_171213_TS, MK_MW07,	MC-MW04, MD-MW03, MD_MW04, R01_171213	17-DEC-2013	23-DEC-2013	24-DEC-2013	✓	03-JAN-2014	12-FEB-2014	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
<b>Amber Glass Bottle - Unpreserved (EP075(SIM))</b> R01_161213		16-DEC-2013	23-DEC-2013	23-DEC-2013	✓	03-JAN-2014	12-FEB-2014	✓
<b>Amber Glass Bottle - Unpreserved (EP075(SIM))</b> MC-MW03, MD-MW01, D01_171213_TS, MK_MW07,	MC-MW04, MD-MW03, MD_MW04, R01_171213	17-DEC-2013	23-DEC-2013	24-DEC-2013	✓	03-JAN-2014	12-FEB-2014	✓
<b>EP080: BTEXN</b>								
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> R01_161213		16-DEC-2013	23-DEC-2013	30-DEC-2013	✓	23-DEC-2013	30-DEC-2013	✓
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MC-MW03, MD-MW01, D01_171213_TS, MK_MW07, TB5,	MC-MW04, MD-MW03, MD_MW04, R01_171213, TS5	17-DEC-2013	23-DEC-2013	31-DEC-2013	✓	23-DEC-2013	31-DEC-2013	✓



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP080/071: Total Petroleum Hydrocarbons</b>							
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> R01_161213	<b>16-DEC-2013</b>	<b>23-DEC-2013</b>	30-DEC-2013	✓	<b>23-DEC-2013</b>	30-DEC-2013	✓
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MC-MW03, MD-MW01, D01_171213_TS, MK_MW07, TB5 MC-MW04, MD-MW03, MD_MW04, R01_171213,	<b>17-DEC-2013</b>	<b>23-DEC-2013</b>	31-DEC-2013	✓	<b>23-DEC-2013</b>	31-DEC-2013	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Alkalinity by PC Titrator	ED037-P	3	27	11.1	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	4	39	10.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	2	18	11.1	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	2	17	11.8	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	5	38	13.2	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	2	18	11.1	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	4	40	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	39	10.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	8	12.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	14	14.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	16	12.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
Alkalinity by PC Titrator	ED037-P	2	27	7.4	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	4	39	10.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	3	38	7.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	9	11.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	3	33.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	39	5.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatle Fraction	EP071	1	9	11.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	14	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	16	6.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
Chloride by Discrete Analyser	ED045G	2	39	5.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	3	38	7.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



Matrix: **WATER** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Method Blanks (MB) - Continued</b>							
Fluoride by PC Titrator	EK040P	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	9	11.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	3	33.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	39	5.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	9	11.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	14	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	16	6.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
Chloride by Discrete Analyser	ED045G	2	39	5.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	3	38	7.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	39	5.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	14	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	16	6.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement





## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Sulfate (Turbidimetric) as SO <sub>4</sub> <sup>2-</sup> by Discrete Analyser	ED041G	WATER	APHA 21st ed., 4500-SO <sub>4</sub> Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> <sup>2-</sup> concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Chloride by Discrete Analyser	ED045G	WATER	APHA 21st ed., 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	Major Cations is determined based on APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um filtered sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Hardness parameters are calculated based on APHA 21st ed., 2340 B. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): Samples are 0.45 um filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) Samples are 0.45 um filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)



Analytical Methods	Method	Matrix	Method Descriptions
Total Mercury by FIMS	EG035T	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Ferrous Iron by Discrete Analyser	EG051G	WATER	APHA 21st ed., 3500 Fe-B. A colorimetric determination based on the reaction between phenanthroline and ferrous iron at pH 3.2-3.3 to form an orange-red complex that is measured against a five-point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Fluoride by PC Titrator	EK040P	WATER	APHA 21st ed., 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by Turbi SO4 by DA. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Polychlorinated Biphenyls (PCB)	EP066	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
TPH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Volatile Organic Compounds	EP074	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
TPH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
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<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Digestion for Total Recoverable Metals	EN25	WATER	USEPA SW846-3005 Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Lab Acidification of Metals	EN80	WATER	USEPA Method 200.8
Lab Acidification of Dissolved Metals	EN80F	WATER	US EPA Method 200.8
Separatory Funnel Extraction of Liquids	ORG14	WATER	USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.



## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Laboratory Control Spike (LCS) Recoveries</b>							
EP075(SIM)A: Phenolic Compounds	3852143-011	----	2-Chlorophenol	95-57-8	61.1 %	63.8-110%	Recovery less than lower control limit
<b>Matrix Spike (MS) Recoveries</b>							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	ES1327849-002	Anonymous	Sulfate as SO4 - Turbidimetric	14808-79-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	ES1327989-002	Anonymous	Sulfate as SO4 - Turbidimetric	14808-79-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG051G: Ferrous Iron by Discrete Analyser	ES1328000-004	Anonymous	Ferrous Iron	----	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG094F: Dissolved Metals in Fresh Water by ORC-ICP	ES1327849-006	Anonymous	Manganese	7439-96-5	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG094F: Dissolved Metals in Fresh Water by ORC-ICP	ES1327849-006	Anonymous	Nickel	7440-02-0	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG094F: Dissolved Metals in Fresh Water by ORC-ICP	ES1327849-006	Anonymous	Zinc	7440-66-6	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.

#### Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

Matrix: **WATER**

Method Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EG051G: Ferrous Iron by Discrete Analyser						



Matrix: **WATER**

Method Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
<b>EG051G: Ferrous Iron by Discrete Analyser - Analysis Holding Time Compliance</b>						
<b>Clear Plastic Bottle - Natural</b> MC-MW03, MC-MW04, MD-MW01, MD-MW03	----	----	----	22-DEC-2013	18-DEC-2013	4

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- **No Quality Control Sample Frequency Outliers exist.**

**SAMPLE RECEIPT NOTIFICATION (SRN)****Comprehensive Report****Work Order : ES1328041**

**Client : ENVIRO RESOURCES MANAGEMENT**  
**Contact : SYMPHONY DELTAWEST**  
**Address : GRND FLOOR, 33 SAUNDERS STREET PYRMONT NSW AUSTRALIA 2009**

**Laboratory : Environmental Division Sydney**  
**Contact : Barbara Hanna**  
**Address : 277-289 Woodpark Road Smithfield NSW Australia 2164**

**E-mail : symphony.deltawest@erm.com**  
**Telephone : +61 02 8584 8888**  
**Facsimile : +61 02 8584 8800**

**E-mail : Barbara.Hanna@alsglobal.com**  
**Telephone : +61 2 8784 8555**  
**Facsimile : +61 2 8784 8555**

**Project : SYMPHONY-DELTA WEST**  
**Order number : 0207423**  
**C-O-C number : ----**

**Page : 1 of 3**  
**Quote number : ES2013ENVRES0360 (SY/551/13 V4)**

**Site : ----**  
**Sampler : TS**  
**QC Level : NEPM 2013 Schedule B(3) and ALS QCS3 requirement**

**Dates**

**Date Samples Received : 19-DEC-2013**  
**Client Requested Due Date : 06-JAN-2014**

**Issue Date : 21-DEC-2013 12:51**  
**Scheduled Reporting Date : 06-JAN-2014**

**Delivery Details**

**Mode of Delivery : Carrier**  
**No. of coolers/boxes : 4 HARD**  
**Security Seal : Intact.**

**Temperature : 5.0°C - Ice present**  
**No. of samples received : 11**  
**No. of samples analysed : 11**

**General Comments**

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

Method	Sample Container Received	Preferred Sample Container for Analysis
<i>Client sample ID</i>		
<b>EG051G : Ferrous Iron by Discrete Analyser</b>		
<b>MC-MW03</b>	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - HCl - Filtered
<b>MC-MW04</b>	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - HCl - Filtered
<b>MD-MW01</b>	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - HCl - Filtered
<b>MD-MW03</b>	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - HCl - Filtered

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EG020F Dissolved Metals by ICPMS	WATER - EG035F Dissolved Mercury by FIMS	WATER - EG051G Ferrous Iron by Discrete Analyser	WATER - EG094A-F Dissolved Metals in Fresh Water Suite A by	WATER - EG094B-F Dissolved Metals in fresh water Suite B by	WATER - EK040-P Fluoride(PC)	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP066-PCB-WA Polychlorinated Biphenyls (PCB)
ES1328041-001	17-DEC-2013 08:29	MC-MW03		✓	✓	✓	✓	✓	✓	✓
ES1328041-002	17-DEC-2013 09:27	MC-MW04		✓	✓	✓	✓	✓	✓	✓
ES1328041-003	17-DEC-2013 10:40	MD-MW01	✓		✓			✓	✓	
ES1328041-004	17-DEC-2013 11:55	MD-MW03		✓	✓	✓	✓	✓	✓	
ES1328041-005	17-DEC-2013 11:55	D01_171213_TS		✓		✓	✓	✓	✓	
ES1328041-006	17-DEC-2013 14:15	MD_MW04	✓		✓			✓	✓	
ES1328041-007	17-DEC-2013 15:15	MK_MW07		✓	✓	✓	✓	✓	✓	✓

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EP074 (water) Volatile Organic Compounds	WATER - EP080 BTEXN	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)	WATER - W-18 TRH(C6 - C9)/BTEXN	WATER - W-24 TPH/BTEX/PAH/Phenols	WATER - W-27 TRH/BTEX/PAH/Phenols/8 Metals	WATER - W-27T TRH/BTEX/PAH/Phenols/Total 8 Metals
ES1328041-001	17-DEC-2013 08:29	MC-MW03	✓		✓	✓		✓		
ES1328041-002	17-DEC-2013 09:27	MC-MW04	✓		✓	✓		✓		
ES1328041-003	17-DEC-2013 10:40	MD-MW01	✓		✓	✓			✓	
ES1328041-004	17-DEC-2013 11:55	MD-MW03	✓		✓	✓		✓		
ES1328041-005	17-DEC-2013 11:55	D01_171213_TS	✓		✓	✓		✓		
ES1328041-006	17-DEC-2013 14:15	MD_MW04	✓		✓	✓			✓	
ES1328041-007	17-DEC-2013 15:15	MK_MW07	✓		✓	✓		✓		
ES1328041-008	16-DEC-2013 15:00	R01_161213								✓
ES1328041-009	17-DEC-2013 15:00	R01_171213								✓
ES1328041-010	17-DEC-2013 15:00	TB5					✓			
ES1328041-011	17-DEC-2013 15:00	TS5		✓						





## Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: **WATER**

Evaluation: ✘ = Holding time breach ; ✔ = Within holding time.

Method		Due for extraction	Due for analysis	Samples Received		Instructions Received	
Client Sample ID(s)	Container			Date	Evaluation	Date	Evaluation
<b>EG051G: Ferrous Iron by Discrete Analyser</b>							
MC-MW03	Clear Plastic Bottle - Natural	----	18-DEC-2013	19-DEC-2013	✘	----	----
MC-MW04	Clear Plastic Bottle - Natural	----	18-DEC-2013	19-DEC-2013	✘	----	----
MD-MW01	Clear Plastic Bottle - Natural	----	18-DEC-2013	19-DEC-2013	✘	----	----
MD-MW03	Clear Plastic Bottle - Natural	----	18-DEC-2013	19-DEC-2013	✘	----	----

## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com

### SYMPHONY ERARING

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email Symphony.Eraring@erm.com  
Email Symphony.Eraring@erm.com  
Email Symphony.Eraring@erm.com  
Email Symphony.Eraring@erm.com  
Email Symphony.Eraring@erm.com  
Email Symphony.Eraring@erm.com  
Email Symphony.Eraring@erm.com  
Email Symphony.Eraring@erm.com  
Email Symphony.Eraring@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

**CHAIN OF CUSTODY**  
ALS Laboratory  
please refer to

1. This form is to be filled out by the person who collects the sample and is to be kept with the sample until it is analyzed.  
2. The person who collects the sample must sign and date this form.  
3. The person who analyzes the sample must sign and date this form.  
4. The person who receives the sample must sign and date this form.  
5. The person who transports the sample must sign and date this form.  
6. The person who stores the sample must sign and date this form.  
7. The person who retrieves the sample must sign and date this form.  
8. The person who returns the sample must sign and date this form.

9. The person who analyzes the sample must sign and date this form.  
10. The person who receives the sample must sign and date this form.  
11. The person who transports the sample must sign and date this form.  
12. The person who stores the sample must sign and date this form.  
13. The person who retrieves the sample must sign and date this form.  
14. The person who returns the sample must sign and date this form.

15. The person who analyzes the sample must sign and date this form.  
16. The person who receives the sample must sign and date this form.  
17. The person who transports the sample must sign and date this form.  
18. The person who stores the sample must sign and date this form.  
19. The person who retrieves the sample must sign and date this form.  
20. The person who returns the sample must sign and date this form.

21. The person who analyzes the sample must sign and date this form.  
22. The person who receives the sample must sign and date this form.  
23. The person who transports the sample must sign and date this form.  
24. The person who stores the sample must sign and date this form.  
25. The person who retrieves the sample must sign and date this form.  
26. The person who returns the sample must sign and date this form.

27. The person who analyzes the sample must sign and date this form.  
28. The person who receives the sample must sign and date this form.  
29. The person who transports the sample must sign and date this form.  
30. The person who stores the sample must sign and date this form.  
31. The person who retrieves the sample must sign and date this form.  
32. The person who returns the sample must sign and date this form.

**CLIENT:** ERMI  
**OFFICE:** GROUND FLOOR, 35 SAUNDERS ST, PYRMONT NSW 2009  
**PROJECT:** SYMPHONY - DELIA FIRST  
**ORDER NUMBER:** 0207420207423  
**PROJECT MANAGER:** Jonathan Lakowski  
**CONTACT PH:** 8504 8888  
**SAMPLER:** T. Snow  
**SAMPLER MODEL:** O435 660035  
**ECO FORMAT (or default):** ES04TIPRFLS  
**ECO omitted to ALS? (YES/NO):** (NO)  
**ECO FORMAT (or default):** ES04TIPRFLS  
**Send Reports to (will default to PM if no other addresses are listed):** Symphony.Delias@am.com  
**Send Invoices to (will default to PM if no other addresses are listed):** Symphony.Delias@am.com

**TURNAROUND REQUIREMENTS:**  
Standard TAT may be longer for some tests etc.  Non Standard at agent TAT (List due date)  
Ultra Trace Organics  
ALS QUOTE NO.: SY181113 V4

**RECEIVED BY:** Thelene Snow  
**DATE/TIME:** 18.12.13 10:00  
**RECEIVED BY:** Steven  
**DATE/TIME:** 19/12/13 8:30

**RECEIVED BY:**  
**DATE/TIME:**

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (codes below)	(order to)	TOTAL CONTAINERS	W-4 (TPH/TRH (CS-C3 for 40))/BTEKH	8 Ultra Trace Dissolved Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg) -	Additional Metals Ultra Trace - Se, Eo, Bi, Mn	Ferrous Iron	PAH/Phenols	VOC Scan	PCB	Cations/Anions	Additional Information
1	MC-MW03	17.12.13	Water	2x P, 1x V, 1x D	6	6	X	X	X	X	X	X	X	X	ferrous non sampled in unreserved collection both held at 11.
2	MC-MW04	11.01.14	"	"	6	6	X	X	X	X	X	X	X	"	
3	MD-MW01	11.11.13	"	"	6	6	X	X	X	X	X	X	X	"	
4	MD-MW03	11.11.13	"	"	6	6	X	X	X	X	X	X	X	"	
5	PO1-171213-TS	11.11.13	"	"	6	6	X	X	X	X	X	X	X	"	
6	MD-MW04	11.11.13	"	"	6	6	X	X	X	X	X	X	X	"	
7	MC-MW07	15.12.13	"	"	6	6	X	X	X	X	X	X	X	"	
8	PO1-161213	16.12.13	"	"	4	4	X	X	X	X	X	X	X	"	
9	PO1-171213	17.12.13	"	"	4	4	X	X	X	X	X	X	X	"	
10	TS	"	"	"	1	1	X	X	X	X	X	X	X	"	
11	TS	"	"	"	1	1	X	X	X	X	X	X	X	"	

Environmental Division  
Sydney  
Work Order  
**ES1328041**



SYDNEY LAB.

**CHAIN OF CUSTODY**  
ALS Laboratory  
Phase Book 3

ALS Laboratory  
355-4500  
150-1500  
Ph: 07 4371 4500  
E: chainofcustody@als.com.au

ALS Laboratory  
355-4500  
150-1500  
Ph: 07 4371 4500  
E: chainofcustody@als.com.au

ALS Laboratory  
355-4500  
150-1500  
Ph: 07 4371 4500  
E: chainofcustody@als.com.au

ALS Laboratory  
355-4500  
150-1500  
Ph: 07 4371 4500  
E: chainofcustody@als.com.au

**CLIENT:** ERM  
**OFFICE:** GROUND FLOOR, 33 SAUNDERS ST, PYRMONT NSW 2009  
**PROJECT:** Symplicity - Delta West  
**ORDER NUMBER:** 020742007423  
**PROJECT MGR/MGR:** Jonathan Lukawski  
**SAMPLER:** T. Snow  
**COC omitted to ALS? Y/N:** (NO)  
**Small Reports to:** Will default to PH if no other address is provided; Symplicity, Delivered@erm.com  
**Email Invoice to:** Will default to PH if no other address is provided; Symplicity, Delivered@erm.com

**CONTACT PH:** 884 0888  
**SAMPLER MOBILE:** 0433 960033  
**END FORMAT (or default):** ESDAT/PDF/PLK/S  
**RELINQUISHED BY:** Travena Snow  
**DATE/TIME:** 18.12.13 / 07:00  
**RECEIVED BY:** Steven  
**DATE/TIME:** 19/12/13 8:30

**TURNAROUND REQUIREMENTS:**  
Standard TAT may be longer for some tests e.g. ULS Trace (optional), SYB1/1/4 VA  
 Non Standard or urgent TAT (List due date)  
 Standard TAT (List due date)

**COC SEQUENCE NUMBER (Client):**  
COC 1 2 3 4 5 6 7  
**RELINQUISHED BY:**  
**DATE/TIME:**

**FOR LABORATORY USE ONLY (Client):**  
Product reference number  
Reference sample identifier  
Reference number

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (include details)	REFER TO	TOTAL CONTAINERS	W-4 (TPH/TRH (C6-C36) or 40)/BTEXH	8 Ultra Trace Dissolved Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg) -	Additional Metals Ultra Trace - Se, Ba, Bi, Mn	Ferrous Iron	PAH/Phenols	VOC Scan	PCB	Carbon/Anions	Additional Information
1	MC-MW03	17.12.13	Water	2x P, 1x A6, 2x V, 1x P	Water	6	X	X	X	X	X	X	X	X	RECORDS were sampled in unopened extraction bottle field attached.
2	MC-MW04	17.12.13	"	"	"	6	X	X	X	X	X	X	X	"	
3	MD-MW01	17.12.13	"	"	"	6	X	X	X	X	X	X	X	"	
4	MD-MW03	17.12.13	"	"	"	6	X	X	X	X	X	X	X	"	
5	DDL-171213-T5	17.12.13	"	"	"	6	X	X	X	X	X	X	X	"	
6	MD-MW04	17.12.13	"	"	"	6	X	X	X	X	X	X	X	"	
7	MK-MW07	17.12.13	"	"	"	6	X	X	X	X	X	X	X	"	
8	RO1-161213	16.12.13	"	"	"	4	X	X	X	X	X	X	X	"	
9	RO1-171213	17.12.13	"	"	"	4	X	X	X	X	X	X	X	"	
10	TD5	17.12.13	"	"	"	1	X	X	X	X	X	X	X	"	
11	TS5	17.12.13	"	"	"	1	X	X	X	X	X	X	X	"	

Environmental Division  
Sydney  
Work Order  
**ES1328041**  
Telephone : + 61-2-8784 8555

## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>ES1400192</b> <b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : MR JONATHAN LEKAWSKI <b>Address</b> : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007  <b>E-mail</b> : jonathan.lekawski@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800 <b>Project</b> : SYMPHONY DELTA WEST <b>Order number</b> : 0207420/0207423 <b>C-O-C number</b> : ---- <b>Sampler</b> : CF <b>Site</b> : ----  <b>Quote number</b> : SY/551/13 V4	<b>Page</b> : 1 of 3  <b>Laboratory</b> : Environmental Division Sydney <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164  <b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555 <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement  <b>Date Samples Received</b> : 07-JAN-2014 <b>Issue Date</b> : 10-JAN-2014  <b>No. of samples received</b> : 1 <b>No. of samples analysed</b> : 1
--	---

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

### *Signatories*

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Raymond Commodor	Instrument Chemist	Sydney Inorganics



---

### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
^ = This result is computed from individual analyte detections at or above the level of reporting



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

MH\_SS01\_W

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---

---

---

Client sampling date / time

19-DEC-2013 15:00

---

---

---

---

Compound	CAS Number	LOR	Unit	ES1400192-001	---	---	---	---
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	---	---	---	---
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	---	---	---	---
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	76	---	---	---	---
Total Alkalinity as CaCO3	----	1	mg/L	76	---	---	---	---
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	22	---	---	---	---
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	7	---	---	---	---
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	15	---	---	---	---
Magnesium	7439-95-4	1	mg/L	4	---	---	---	---
Sodium	7440-23-5	1	mg/L	15	---	---	---	---
Potassium	7440-09-7	1	mg/L	6	---	---	---	---
<b>EG020T: Total Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	0.001	---	---	---	---
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	---	---	---	---
Chromium	7440-47-3	0.001	mg/L	<0.001	---	---	---	---
Copper	7440-50-8	0.001	mg/L	<0.001	---	---	---	---
Nickel	7440-02-0	0.001	mg/L	0.001	---	---	---	---
Lead	7439-92-1	0.001	mg/L	<0.001	---	---	---	---
Zinc	7440-66-6	0.005	mg/L	<0.005	---	---	---	---
Manganese	7439-96-5	0.001	mg/L	0.214	---	---	---	---
Selenium	7782-49-2	0.01	mg/L	<0.01	---	---	---	---
Boron	7440-42-8	0.05	mg/L	0.08	---	---	---	---
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	---	---	---	---
<b>EK040P: Fluoride by PC Titrator</b>								
Fluoride	16984-48-8	0.1	mg/L	0.2	---	---	---	---
<b>EN055: Ionic Balance</b>								
Total Anions	----	0.01	meq/L	2.17	---	---	---	---
Total Cations	----	0.01	meq/L	1.88	---	---	---	---

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: ES1400192</b>	<b>Page</b>	<b>: 1 of 7</b>
<b>Client</b>	<b>: ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	<b>: Environmental Division Sydney</b>
<b>Contact</b>	<b>: MR JONATHAN LEKAWSKI</b>	<b>Contact</b>	<b>: Barbara Hanna</b>
<b>Address</b>	<b>: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007</b>	<b>Address</b>	<b>: 277-289 Woodpark Road Smithfield NSW Australia 2164</b>
<b>E-mail</b>	<b>: jonathan.lekawski@erm.com</b>	<b>E-mail</b>	<b>: Barbara.Hanna@alsglobal.com</b>
<b>Telephone</b>	<b>: +61 02 8584 8888</b>	<b>Telephone</b>	<b>: +61 2 8784 8555</b>
<b>Facsimile</b>	<b>: +61 02 8584 8800</b>	<b>Facsimile</b>	<b>: +61 2 8784 8555</b>
<b>Project</b>	<b>: SYMPHONY DELTA WEST</b>	<b>QC Level</b>	<b>: NEPM 2013 Schedule B(3) and ALS QCS3 requirement</b>
<b>Site</b>	<b>: ----</b>	<b>Date Samples Received</b>	<b>: 07-JAN-2014</b>
<b>C-O-C number</b>	<b>: ----</b>	<b>Issue Date</b>	<b>: 10-JAN-2014</b>
<b>Sampler</b>	<b>: CF</b>	<b>No. of samples received</b>	<b>: 1</b>
<b>Order number</b>	<b>: 0207420/0207423</b>	<b>No. of samples analysed</b>	<b>: 1</b>
<b>Quote number</b>	<b>: SY/551/13 V4</b>		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

#### Signatories

Ankit Joshi  
Raymond Commodor

#### Position

Inorganic Chemist  
Instrument Chemist

#### Accreditation Category

Sydney Inorganics  
Sydney Inorganics





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### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :            Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
                  CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
                  LOR = Limit of reporting  
                  RPD = Relative Percentage Difference  
                  # = Indicates failed QC



### Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>ED037P: Alkalinity by PC Titrator (QC Lot: 3239256)</b>									
ES1400177-018	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	39	38	3.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	39	38	3.0	0% - 20%
ES1400186-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	295	290	1.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	295	290	1.5	0% - 20%
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3238765)</b>									
ES1400104-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	482	482	0.0	0% - 20%
ES1400182-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	20	24	17.9	0% - 20%
<b>ED045G: Chloride Discrete analyser (QC Lot: 3238769)</b>									
ES1400177-016	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	29	28	4.3	0% - 20%
<b>ED093F: Dissolved Major Cations (QC Lot: 3238768)</b>									
ES1400177-016	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	2	2	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	2	2	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	38	39	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
ES1400185-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	64	65	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	39	39	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	120	119	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
<b>EG020T: Total Metals by ICP-MS (QC Lot: 3239764)</b>									
ES1400012-002	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.003	0.001	65.2	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.022	0.022	0.0	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.0	No Limit
		ES1400121-003	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001
EG020A-T: Arsenic	7440-38-2			0.001	mg/L	0.006	0.006	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG020T: Total Metals by ICP-MS (QC Lot: 3239764) - continued</b>									
ES1400121-003	Anonymous	EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.017	0.017	0.0	0% - 50%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	1.43	1.46	2.0	0% - 20%
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3240041)</b>									
ES1400019-007	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1400186-002	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
<b>EK040P: Fluoride by PC Titrator (QC Lot: 3239251)</b>									
ES1400020-001	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	2.8	2.8	0.0	0% - 20%
ES1400186-001	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.2	0.2	0.0	No Limit





Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike	Spike Recovery(%)	Recovery Limits (%)	
				Concentration	MS	Low	High
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3238765)</b>							
ES1400104-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130
<b>ED045G: Chloride Discrete analyser (QCLot: 3238769)</b>							
ES1400177-016	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	91.8	70	130
<b>EG020T: Total Metals by ICP-MS (QCLot: 3239764)</b>							
ES1400012-003	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	99.2	70	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	109	70	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	98.3	70	130
		EG020A-T: Copper	7440-50-8	1 mg/L	92.5	70	130
		EG020A-T: Lead	7439-92-1	1 mg/L	106	70	130
		EG020A-T: Manganese	7439-96-5	1 mg/L	109	70	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	99.8	70	130
EG020A-T: Zinc	7440-66-6	1 mg/L	95.1	70	130		
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3240041)</b>							
ES1400019-007	Anonymous	EG035T: Mercury	7439-97-6	0.010 mg/L	86.7	70	130
<b>EK040P: Fluoride by PC Titrator (QCLot: 3239251)</b>							
ES1400020-001	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	110	70	130

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report							
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
					MS	MSD	Low	High	Value	Control Limit	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3238765)</b>											
ES1400104-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	----	70	130	----	----	
<b>ED045G: Chloride Discrete analyser (QCLot: 3238769)</b>											
ES1400177-016	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	91.8	----	70	130	----	----	
<b>EK040P: Fluoride by PC Titrator (QCLot: 3239251)</b>											
ES1400020-001	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	110	----	70	130	----	----	
<b>EG020T: Total Metals by ICP-MS (QCLot: 3239764)</b>											
ES1400012-003	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	99.2	----	70	130	----	----	
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	109	----	70	130	----	----	
		EG020A-T: Chromium	7440-47-3	1 mg/L	98.3	----	70	130	----	----	
		EG020A-T: Copper	7440-50-8	1 mg/L	92.5	----	70	130	----	----	



Sub-Matrix: **WATER**

				<i>Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report</i>						
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>Spike</i>	<i>Spike Recovery (%)</i>		<i>Recovery Limits (%)</i>		<i>RPDs (%)</i>	
				<i>Concentration</i>	<i>MS</i>	<i>MSD</i>	<i>Low</i>	<i>High</i>	<i>Value</i>	<i>Control Limit</i>
<b>EG020T: Total Metals by ICP-MS (QCLot: 3239764) - continued</b>										
ES1400012-003	Anonymous	EG020A-T: Lead	7439-92-1	1 mg/L	106	----	70	130	----	----
		EG020A-T: Manganese	7439-96-5	1 mg/L	109	----	70	130	----	----
		EG020A-T: Nickel	7440-02-0	1 mg/L	99.8	----	70	130	----	----
		EG020A-T: Zinc	7440-66-6	1 mg/L	95.1	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3240041)</b>										
ES1400019-007	Anonymous	EG035T: Mercury	7439-97-6	0.010 mg/L	86.7	----	70	130	----	----

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1400192</b>	Page	: 1 of 6
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: SYMPHONY DELTA WEST	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 07-JAN-2014
C-O-C number	: ----	Issue Date	: 10-JAN-2014
Sampler	: CF	No. of samples received	: 1
Order number	: 0207420/0207423	No. of samples analysed	: 1
Quote number	: SY/551/13 V4		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers





## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>ED037P: Alkalinity by PC Titrator</b>							
Clear Plastic Bottle - Natural (ED037-P) MH_SS01_W	19-DEC-2013	---	02-JAN-2014	----	07-JAN-2014	02-JAN-2014	*
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>							
Clear Plastic Bottle - Natural (ED041G) MH_SS01_W	19-DEC-2013	---	16-JAN-2014	----	07-JAN-2014	16-JAN-2014	✓
<b>ED045G: Chloride Discrete analyser</b>							
Clear Plastic Bottle - Natural (ED045G) MH_SS01_W	19-DEC-2013	---	16-JAN-2014	----	07-JAN-2014	16-JAN-2014	✓
<b>ED093F: Dissolved Major Cations</b>							
Clear Plastic Bottle - Natural (ED093F) MH_SS01_W	19-DEC-2013	---	26-DEC-2013	----	07-JAN-2014	26-DEC-2013	*
<b>EG020T: Total Metals by ICP-MS</b>							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T) MH_SS01_W	19-DEC-2013	08-JAN-2014	17-JUN-2014	✓	08-JAN-2014	17-JUN-2014	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) MH_SS01_W	19-DEC-2013	----	----	----	08-JAN-2014	16-JAN-2014	✓
<b>EK040P: Fluoride by PC Titrator</b>							
Clear Plastic Bottle - Natural (EK040P) MH_SS01_W	19-DEC-2013	---	16-JAN-2014	----	07-JAN-2014	16-JAN-2014	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Alkalinity by PC Titrator	ED037-P	2	20	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	1	9	11.1	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	2	19	10.5	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	15	13.3	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	14	14.3	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	17	11.8	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	2	19	10.5	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
Alkalinity by PC Titrator	ED037-P	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	9	22.2	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	19	5.3	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	15	6.7	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	14	7.1	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	17	5.9	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	19	5.3	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
Chloride by Discrete Analyser	ED045G	1	9	11.1	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	19	5.3	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	15	6.7	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	14	7.1	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	17	5.9	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	19	5.3	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
Chloride by Discrete Analyser	ED045G	1	9	11.1	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	19	5.3	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	14	7.1	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	17	5.9	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	19	5.3	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Sulfate (Turbidimetric) as SO <sub>4</sub> <sup>2-</sup> by Discrete Analyser	ED041G	WATER	APHA 21st ed., 4500-SO <sub>4</sub> Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> <sup>2-</sup> concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Chloride by Discrete Analyser	ED045G	WATER	APHA 21st ed., 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	Major Cations is determined based on APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um filtered sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)  Hardness parameters are calculated based on APHA 21st ed., 2340 B. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Fluoride by PC Titrator	EK040P	WATER	APHA 21st ed., 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
Ionic Balance by PCT DA and Turbi SO <sub>4</sub> DA	EN055 - PG	WATER	APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by Turbi SO <sub>4</sub> by DA. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
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Page : 5 of 6  
Work Order : ES1400192  
Client : ENVIRO RESOURCES MANAGEMENT  
Project : SYMPHONY DELTA WEST



<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Digestion for Total Recoverable Metals	EN25	WATER	USEPA SW846-3005 Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)



## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Matrix Spike (MS) Recoveries</b>							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	ES1400104-001	Anonymous	Sulfate as SO4 - Turbidimetric	14808-79-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.

#### Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

Matrix: **WATER**

Method	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
<b>ED037P: Alkalinity by PC Titrator</b>						
Clear Plastic Bottle - Natural MH_SS01_W	----	----	----	07-JAN-2014	02-JAN-2014	5
<b>ED093F: Dissolved Major Cations</b>						
Clear Plastic Bottle - Natural MH_SS01_W	----	----	----	07-JAN-2014	26-DEC-2013	12

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

**Work Order : ES1400192**

<p><b>Client : ENVIRO RESOURCES MANAGEMENT</b></p> <p><b>Contact : MR JONATHAN LEKAWSKI</b></p> <p><b>Address : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007</b></p>	<p><b>Laboratory : Environmental Division Sydney</b></p> <p><b>Contact : Barbara Hanna</b></p> <p><b>Address : 277-289 Woodpark Road Smithfield NSW Australia 2164</b></p>
--	--

<p><b>E-mail : jonathan.lekawski@erm.com</b></p> <p><b>Telephone : +61 02 8584 8888</b></p> <p><b>Facsimile : +61 02 8584 8800</b></p>	<p><b>E-mail : Barbara.Hanna@alsglobal.com</b></p> <p><b>Telephone : +61 2 8784 8555</b></p> <p><b>Facsimile : +61 2 8784 8555</b></p>
--	--

<p><b>Project : SYMPHONY DELTA WEST</b></p> <p><b>Order number : 0207420/0207423</b></p> <p><b>C-O-C number : ----</b></p> <p><b>Site : ----</b></p> <p><b>Sampler : CF</b></p>	<p><b>Page : 1 of 2</b></p> <p><b>Quote number : ES2013ENVRES0360 (SY/551/13 V4)</b></p> <p><b>QC Level : NEPM 2013 Schedule B(3) and ALS QCS3 requirement</b></p>
---	--

#### Dates

<p><b>Date Samples Received : 07-JAN-2014</b></p> <p><b>Client Requested Due Date : 13-JAN-2014</b></p>	<p><b>Issue Date : 07-JAN-2014 13:59</b></p> <p><b>Scheduled Reporting Date : <b>13-JAN-2014</b></b></p>
---	--

#### Delivery Details

<p><b>Mode of Delivery : Carrier</b></p> <p><b>No. of coolers/boxes : REBATCH</b></p> <p><b>Security Seal : Not intact.</b></p>	<p><b>Temperature : 4.3°C</b></p> <p><b>No. of samples received : 1</b></p> <p><b>No. of samples analysed : 1</b></p>
---	---

#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Breaches in recommended extraction / analysis holding times may occur. Please refer to the 'Proactive Holding Time Report' below for further details. Please contact ALS if further information is required.**
- **This is a rebatch of ES1327997.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EG020T Total Recoverable Metals by ICPMS (including WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & WATER - NT-01 Major Cations (Ca, Mg, Na, K) WATER - NT-02A Major Anions (Chloride, Sulphate, Fluoride, WATER - W-02T 8 metals (Total)
ES1400192-001	19-DEC-2013 15:00	MH_SS01_W	✓ ✓ ✓ ✓ ✓

## Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: **WATER**

Evaluation: ✗ = Holding time breach ; ✓ = Within holding time.

Method		Due for extraction	Due for analysis	Samples Received		Instructions Received	
Client Sample ID(s)	Container			Date	Evaluation	Date	Evaluation
<b>ED037-P: Alkalinity by PC Titrator</b>							
MH_SS01_W	Clear Plastic Bottle - Natural	02-JAN-2014	----	07-JAN-2014	✗	----	----
<b>ED093F: Major Cations - Dissolved</b>							
MH_SS01_W	Clear Plastic Bottle - Natural	26-DEC-2013	----	07-JAN-2014	✗	----	----

## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com

### SYMPHONY ERARING

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email Symphony.Eraring@erm.com  
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Email Symphony.Eraring@erm.com  
Email Symphony.Eraring@erm.com  
Email Symphony.Eraring@erm.com  
Email Symphony.Eraring@erm.com  
Email Symphony.Eraring@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com



David 7/1 1230

**Fadi Soro**

**From:** Barbara Hanna  
**Sent:** Tuesday, 7 January 2014 11:25 AM  
**To:** Fadi Soro; Wael Saleh  
**Subject:** FW: ES1327997

Hi Guys,

Please arrange this rebatch ASAP. The TAT for this is 4 days.

Thanks!!

Kind Regards

**Barbara Hanna**

Client Services Manager  
ALS | Environmental Division  
277-289 Woodpark Road  
Smithfield NSW 2164 Australia

Environmental Division  
Sydney  
Work Order

**ES1400192**



Telephone : +61-2-8784 8555

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*EnviroMail 69 - Testing Requirements of the new NEPM - July 2013*

*EnviroMail 70 - Variation of Naphthalene by SVOC and VOC Methods in Water - July 2013*

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Reduction in Sample Volumes - Improving quality, safety, efficiency and sustainability in environmental practices



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**From:** Anne Ashworth [mailto:Anne.Ashworth@erm.com]  
**Sent:** Tuesday, 7 January 2014 10:36 AM  
**To:** Barbara Hanna  
**Subject:** RE: ES1327997

Yes, please analyse for standard metals (8 metals + Se/Mn/FI/Bo).

Thanks

Anne

Anne Ashworth  
Environmental Scientist

ERM Australia and New Zealand  
Building C, 33 Saunders Street Pyrmont NSW 2009  
Locked Bag 24 Broadway NSW 2007

direct + 61 (0)2 8584 8870  
switch + 61 (0)2 8584 8888  
mobile 0466 017 512

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**From:** Barbara Hanna [mailto:Barbara.Hanna@alsglobal.com]  
**Sent:** Tuesday, January 07, 2014 9:14 AM  
**To:** Anne Ashworth  
**Cc:** ERM Australia Project Symphony Delta West  
**Subject:** RE: ES1327997

Hi Anne,

I can arrange this analysis for you except the ultra-trace metals only a standard bottle was submitted. Would you like us to proceed with the standard analysis?

Kind Regards

**Barbara Hanna**

Client Services Manager  
ALS | Environmental Division

277-289 Woodpark Road  
Smithfield NSW 2164 Australia

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*Please see our latest [EnviroMail 68 - Sampling and Analysis Implications of the new NEPM - July 2013](#)*

*[EnviroMail 69 - Testing Requirements of the new NEPM - July 2013](#)*

*[EnviroMail 70 - Variation of Naphthalene by SVOC and VOC Methods in Water - July 2013](#)*

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Reduction in Sample Volumes - Improving quality, safety, efficiency and sustainability in environmental practices



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---

**From:** Anne Ashworth [<mailto:Anne.Ashworth@erm.com>]  
**Sent:** Monday, 6 January 2014 5:57 PM

**To:** Barbara Hanna  
**Cc:** ERM Australia Project Symphony Delta West  
**Subject:** ES1327997

Hi Barbara,

①

Please re-batch sample ES1327997-005 (MH\_SS01\_w) for analysis for metals (ultra-trace, 8 metals + Se/Mn/F/Bo and cations/anions).

Cheers

Anne Ashworth  
Environmental Scientist

**ERM Australia and New Zealand**  
Building C, 33 Saunders Street Pyrmont NSW 2009  
Locked Bag 24 Broadway NSW 2007

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enquiries@envirolabservices.com.au  
www.envirolabservices.com.au

## **SAMPLE RECEIPT ADVICE**

### **Client:**

Environmental Resources Management Australia  
Locked Bag 24  
Broadway NSW 2007

ph: 02 8584 8888

Fax: 02 8584 8800

Attention: Jonathan Lekawksi

### **Sample log in details:**

Your reference:

Envirolab Reference:

Date received:

Date results expected to be reported:

**Wallerawang/ Mt Piper GW**

**100833**

14/11/13

**21/11/13**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	1 water
Turnaround time requested:	Standard
Temperature on receipt (°C)	4.1
Cooling Method:	Ice
Sampling Date Provided:	YES

### **Comments:**

Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples.

### **Contact details:**

Please direct any queries to Aileen Hie or Jacinta Hurst

ph: 02 9910 6200 fax: 02 9910 6201

email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au



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## SAMPLE RECEIPT ADVICE

### **Client:**

Environmental Resources Management Australia  
Locked Bag 24  
Broadway NSW 2007

ph: 02 8584 8888

Fax: 02 8584 8800

Attention: Jonathan Lekawksi

### **Sample log in details:**

Your reference:

**0207423, Symphony Mt Piper**

Envirolab Reference:

**102901**

Date received:

19/12/2013

Date results expected to be reported:

**8/01/14**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	1 water
Turnaround time requested:	Standard
Temperature on receipt (°C)	11.2
Cooling Method:	Ice
Sampling Date Provided:	YES

### **Comments:**

Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples.

### **Contact details:**

Please direct any queries to Aileen Hie or Jacinta Hurst

ph: 02 9910 6200 fax: 02 9910 6201

email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au



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www.envirolabservices.com.au

## **SAMPLE RECEIPT ADVICE**

### **Client:**

Environmental Resources Management Australia  
Locked Bag 24  
Broadway NSW 2007

ph: 02 8584 8888

Fax: 02 8584 8800

Attention: Jonathan Lekawksi

### **Sample log in details:**

Your reference:

**0207420, Symphony Delta West**

Envirolab Reference:

**102903**

Date received:

19/12/2013

Date results expected to be reported:

**8/01/14**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	1 water
Turnaround time requested:	Standard
Temperature on receipt (°C)	13.6
Cooling Method:	Ice
Sampling Date Provided:	YES

### **Comments:**

Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples.

### **Contact details:**

Please direct any queries to Aileen Hie or Jacinta Hurst

ph: 02 9910 6200 fax: 02 9910 6201

email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au





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## **SAMPLE RECEIPT ADVICE**

### **Client:**

Environmental Resources Management Australia  
Locked Bag 24  
Broadway NSW 2007

ph: 02 8584 8888  
Fax: 02 8584 8800

Attention: Jonathan Lekawksi

### **Sample log in details:**

Your reference:

**0207423, Symphony Mt Piper**

Envirolab Reference:

**103024**

Date received:

**23/12/2013**

Date results expected to be reported:

**8/01/14**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	2 waters
Turnaround time requested:	Standard
Temperature on receipt (°C)	4.2
Cooling Method:	Ice
Sampling Date Provided:	YES

### **Comments:**

Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples.

### **Contact details:**

Please direct any queries to Aileen Hie or Jacinta Hurst

ph: 02 9910 6200 fax: 02 9910 6201

email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

**CERTIFICATE OF ANALYSIS**

**100336**

**Client:**

**Environmental Resources Management Australia**

Locked Bag 24

Broadway

NSW 2007

**Attention:** Chuck Terhune, Jonathon Lekawski

**Sample log in details:**

Your Reference: **0207420, Symphony - WW**  
No. of samples: 1 soil  
Date samples received / completed instructions received 06/11/13 / 06/11/13

**Analysis Details:**

Please refer to the following pages for results, methodology summary and quality control data. Samples were analysed as received from the client. Results relate specifically to the samples as received. Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

***Please refer to the last page of this report for any comments relating to the results.***

**Report Details:**

Date results requested by: / Issue Date: 13/11/13 / 13/11/13

Date of Preliminary Report: Not issued

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**Results Approved By:**



---

Jacinta Hurst  
Laboratory Manager

VOCs in soil Our Reference: Your Reference	UNITS -----	100336-1 T01_311013_ TS
Date Sampled Type of sample	-----	31/10/2013 Soil
Date extracted	-	08/11/2013
Date analysed	-	09/11/2013
Dichlorodifluoromethane	mg/kg	<1
Chloromethane	mg/kg	<1
Vinyl Chloride	mg/kg	<1
Bromomethane	mg/kg	<1
Chloroethane	mg/kg	<1
Trichlorofluoromethane	mg/kg	<1
1,1-Dichloroethene	mg/kg	<1
trans-1,2-dichloroethene	mg/kg	<1
1,1-dichloroethane	mg/kg	<1
cis-1,2-dichloroethene	mg/kg	<1
bromochloromethane	mg/kg	<1
chloroform	mg/kg	<1
2,2-dichloropropane	mg/kg	<1
1,2-dichloroethane	mg/kg	<1
1,1,1-trichloroethane	mg/kg	<1
1,1-dichloropropene	mg/kg	<1
Cyclohexane	mg/kg	<1
carbon tetrachloride	mg/kg	<1
Benzene	mg/kg	<0.2
dibromomethane	mg/kg	<1
1,2-dichloropropane	mg/kg	<1
trichloroethene	mg/kg	<1
bromodichloromethane	mg/kg	<1
trans-1,3-dichloropropene	mg/kg	<1
cis-1,3-dichloropropene	mg/kg	<1
1,1,2-trichloroethane	mg/kg	<1
Toluene	mg/kg	<0.5
1,3-dichloropropane	mg/kg	<1
dibromochloromethane	mg/kg	<1
1,2-dibromoethane	mg/kg	<1
tetrachloroethene	mg/kg	<1
1,1,1,2-tetrachloroethane	mg/kg	<1
chlorobenzene	mg/kg	<1
Ethylbenzene	mg/kg	<1
bromoform	mg/kg	<1
m+p-xylene	mg/kg	<2
styrene	mg/kg	<1
1,1,2,2-tetrachloroethane	mg/kg	<1
o-Xylene	mg/kg	<1

VOCs in soil Our Reference: Your Reference	UNITS -----	100336-1 T01_311013_ TS
Date Sampled Type of sample	-----	31/10/2013 Soil
1,2,3-trichloropropane	mg/kg	<1
isopropylbenzene	mg/kg	<1
bromobenzene	mg/kg	<1
n-propyl benzene	mg/kg	<1
2-chlorotoluene	mg/kg	<1
4-chlorotoluene	mg/kg	<1
1,3,5-trimethyl benzene	mg/kg	<1
tert-butyl benzene	mg/kg	<1
1,2,4-trimethyl benzene	mg/kg	<1
1,3-dichlorobenzene	mg/kg	<1
sec-butyl benzene	mg/kg	<1
1,4-dichlorobenzene	mg/kg	<1
4-isopropyl toluene	mg/kg	<1
1,2-dichlorobenzene	mg/kg	<1
n-butyl benzene	mg/kg	<1
1,2-dibromo-3-chloropropane	mg/kg	<1
1,2,4-trichlorobenzene	mg/kg	<1
hexachlorobutadiene	mg/kg	<1
1,2,3-trichlorobenzene	mg/kg	<1
Surrogate Dibromofluorometha	%	107
Surrogate aaa-Trifluorotoluene	%	109
Surrogate Toluene-d8	%	93
Surrogate 4-Bromofluorobenzene	%	69

vTRH(C6-C10)/BTEXn in Soil		
Our Reference:	UNITS	100336-1
Your Reference	-----	T01_311013_
		TS
Date Sampled	-----	31/10/2013
Type of sample		Soil
Date extracted	-	08/11/2013
Date analysed	-	09/11/2013
TRHC <sub>6</sub> - C <sub>9</sub>	mg/kg	<25
TRHC <sub>6</sub> - C <sub>10</sub>	mg/kg	<25
vTPHC <sub>6</sub> - C <sub>10</sub> less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
naphthalene	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	109

svTRH (C10-C40) in Soil		
Our Reference:	UNITS	100336-1
Your Reference	-----	T01_311013_
		TS
Date Sampled	-----	31/10/2013
Type of sample		Soil
Date extracted	-	08/11/2013
Date analysed	-	11/11/2013
TRHC <sub>10</sub> - C <sub>14</sub>	mg/kg	<50
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	<100
TRHC <sub>29</sub> - C <sub>36</sub>	mg/kg	<100
TRH>C <sub>10</sub> -C <sub>16</sub>	mg/kg	<50
TRH>C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	mg/kg	<50
TRH>C <sub>16</sub> -C <sub>34</sub>	mg/kg	<100
TRH>C <sub>34</sub> -C <sub>40</sub>	mg/kg	<100
Surrogate o-Terphenyl	%	95

PAHs in Soil		
Our Reference:	UNITS	100336-1
Your Reference	-----	T01_311013_
		TS
Date Sampled	-----	31/10/2013
Type of sample		Soil
Date extracted	-	08/11/2013
Date analysed	-	09/11/2013
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Benzo(a)pyrene TEQNEPMB1	mg/kg	<0.5
Total +ve PAH's	mg/kg	NIL (+)VE
Surrogate p-Terphenyl-d14	%	118



PCBs in Soil		
Our Reference:	UNITS	100336-1
Your Reference	-----	T01_311013_
		TS
Date Sampled	-----	31/10/2013
Type of sample		Soil
Date extracted	-	08/11/2013
Date analysed	-	09/11/2013
Arochlor 1016	mg/kg	<0.1
Arochlor 1221	mg/kg	<0.1
Arochlor 1232	mg/kg	<0.1
Arochlor 1242	mg/kg	<0.1
Arochlor 1248	mg/kg	<0.1
Arochlor 1254	mg/kg	<0.1
Arochlor 1260	mg/kg	<0.1
Surrogate TCLMX	%	91

Total Phenolics in Soil		
Our Reference:	UNITS	100336-1
Your Reference	-----	T01_311013_
		TS
Date Sampled	-----	31/10/2013
Type of sample		Soil
Date extracted	-	08/11/2013
Date analysed	-	08/11/2013
Total Phenolics (as Phenol)	mg/kg	<5

Acid Extractable metals in soil		
Our Reference:	UNITS	100336-1
Your Reference	-----	T01_311013_
		TS
Date Sampled	-----	31/10/2013
Type of sample		Soil
Date digested	-	08/11/2013
Date analysed	-	08/11/2013
Arsenic	mg/kg	4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	6
Copper	mg/kg	9
Lead	mg/kg	17
Mercury	mg/kg	<0.1
Nickel	mg/kg	8
Zinc	mg/kg	23
Selenium	mg/kg	<2

Moisture		
Our Reference:	UNITS	100336-1
Your Reference	-----	T01_311013_
		TS
Date Sampled	-----	31/10/2013
Type of sample		Soil
Date prepared	-	08/11/2013
Date analysed	-	11/11/2013
Moisture	%	20

MethodID	Methodology Summary
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note Naphthalene is determined from the VOC analysis.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Inorg-030	Total Phenolics - determined colorimetrically following distillation, based upon APHA 22nd ED 5530 D.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105+/-5 deg C for a minimum of 12 hours.

Client Reference: 0207420, Symphony - WW

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
VOCs in soil						Base II Duplicate II %RPD		
Date extracted	-			08/11/2013	[NT]	[NT]	LCS-1	08/11/2013
Date analysed	-			09/11/2013	[NT]	[NT]	LCS-1	09/11/2013
Dichlorodifluoromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Chloromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Vinyl Chloride	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Bromomethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Chloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Trichlorofluoromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
1,1-Dichloroethene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
trans-1,2-dichloroethene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
1,1-dichloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	LCS-1	86%
cis-1,2-dichloroethene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
bromochloromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
chloroform	mg/kg	1	Org-014	<1	[NT]	[NT]	LCS-1	99%
2,2-dichloropropane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
1,2-dichloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	LCS-1	94%
1,1,1-trichloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	LCS-1	94%
1,1-dichloropropene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Cyclohexane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
carbon tetrachloride	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Benzene	mg/kg	0.2	Org-014	<0.2	[NT]	[NT]	[NR]	[NR]
dibromomethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
1,2-dichloropropane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
trichloroethene	mg/kg	1	Org-014	<1	[NT]	[NT]	LCS-1	89%
bromodichloromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	LCS-1	96%
trans-1,3-dichloropropene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
cis-1,3-dichloropropene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
1,1,2-trichloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Toluene	mg/kg	0.5	Org-014	<0.5	[NT]	[NT]	[NR]	[NR]
1,3-dichloropropane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
dibromochloromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	LCS-1	99%
1,2-dibromoethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
tetrachloroethene	mg/kg	1	Org-014	<1	[NT]	[NT]	LCS-1	93%
1,1,1,2-tetrachloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
chlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Ethylbenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
bromoform	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
m+p-xylene	mg/kg	2	Org-014	<2	[NT]	[NT]	[NR]	[NR]
styrene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
1,1,2,2-tetrachloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
o-Xylene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
1,2,3-trichloropropane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]

Client Reference: 0207420, Symphony - WW

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
VOCs in soil						Base II Duplicate II %RPD		
isopropylbenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
bromobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
n-propyl benzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
2-chlorotoluene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
4-chlorotoluene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
1,3,5-trimethyl benzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
tert-butyl benzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
1,2,4-trimethyl benzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
1,3-dichlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
sec-butyl benzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
1,4-dichlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
4-isopropyl toluene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
1,2-dichlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
n-butyl benzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
1,2-dibromo-3-chloropropane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
1,2,4-trichlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
hexachlorobutadiene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
1,2,3-trichlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Surrogate Dibromofluorometha	%		Org-014	100	[NT]	[NT]	LCS-1	102%
Surrogate aaa-Trifluorotoluene	%		Org-014	109	[NT]	[NT]	LCS-1	104%
Surrogate Toluene-d8	%		Org-014	94	[NT]	[NT]	LCS-1	96%
Surrogate 4-Bromofluorobenzene	%		Org-014	73	[NT]	[NT]	LCS-1	70%



**Client Reference: 0207420, Symphony - WW**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
vTRH(C6-C10)/BTEXN in Soil						Base II Duplicate II %RPD		
Date extracted	-			08/11/2013	[NT]	[NT]	LCS-1	08/11/2013
Date analysed	-			09/11/2013	[NT]	[NT]	LCS-1	09/11/2013
TRHC <sub>6</sub> - C <sub>9</sub>	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-1	110%
TRHC <sub>6</sub> - C <sub>10</sub>	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-1	110%
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	LCS-1	109%
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	LCS-1	105%
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-1	109%
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	LCS-1	114%
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-1	110%
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	109	[NT]	[NT]	LCS-1	89%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
svTRH(C10-C40) in Soil						Base II Duplicate II %RPD		
Date extracted	-			08/11/2013	[NT]	[NT]	LCS-1	08/11/2013
Date analysed	-			11/11/2013	[NT]	[NT]	LCS-1	11/11/2013
TRHC <sub>10</sub> - C <sub>14</sub>	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-1	132%
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-1	125%
TRHC <sub>29</sub> - C <sub>36</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-1	104%
TRH>C <sub>10</sub> -C <sub>16</sub>	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-1	132%
TRH>C <sub>16</sub> -C <sub>34</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-1	125%
TRH>C <sub>34</sub> -C <sub>40</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-1	104%
Surrogate o-Terphenyl	%		Org-003	105	[NT]	[NT]	LCS-1	81%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Date extracted	-			08/11/2013	[NT]	[NT]	LCS-1	08/11/2013
Date analysed	-			09/11/2013	[NT]	[NT]	LCS-1	09/11/2013
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-1	123%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-1	119%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-1	103%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-1	100%

**Client Reference: 0207420, Symphony - WW**

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-1	127%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-1	100%
Benzo(b+k)fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	[NT]	[NT]	LCS-1	115%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	90	[NT]	[NT]	LCS-1	99%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PCBs in Soil						Base II Duplicate II %RPD		
Date extracted	-			08/11/2013	[NT]	[NT]	LCS-1	08/11/2013
Date analysed	-			09/11/2013	[NT]	[NT]	LCS-1	09/11/2013
Arochlor 1016	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1221	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1232	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1242	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1248	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1254	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	LCS-1	102%
Arochlor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%		Org-006	93	[NT]	[NT]	LCS-1	96%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Total Phenolics in Soil						Base II Duplicate II %RPD		
Date extracted	-			08/11/2013	[NT]	[NT]	LCS-1	08/11/2013
Date analysed	-			08/11/2013	[NT]	[NT]	LCS-1	08/11/2013
Total Phenolics (as Phenol)	mg/kg	5	Inorg-030	<5	[NT]	[NT]	LCS-1	98%

**Client Reference: 0207420, Symphony - WW**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base II Duplicate II %RPD		
Date digested	-			08/11/2013	[NT]	[NT]	LCS-11	08/11/2013
Date analysed	-			08/11/2013	[NT]	[NT]	LCS-11	08/11/2013
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	LCS-11	100%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	[NT]	[NT]	LCS-11	108%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-11	104%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-11	101%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-11	101%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	LCS-11	96%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-11	104%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-11	103%
Selenium	mg/kg	2	Metals-020 ICP-AES	<2	[NT]	[NT]	LCS-11	100%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank				
Moisture								
Date prepared	-			[NT]				
Date analysed	-			[NT]				
Moisture	%	0.1	Inorg-008	[NT]				

**Report Comments:**

Asbestos ID was analysed by Approved Identifier: Not applicable for this job  
 Asbestos ID was authorised by Approved Signatory: Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

**Quality Control Definitions**

**Blank:** This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

**Duplicate:** This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

**Matrix Spike :** A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

**LCS (Laboratory Control Sample) :** This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

**Surrogate Spike:** Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

**Laboratory Acceptance Criteria**

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.



# CHAIN OF CUSTODY

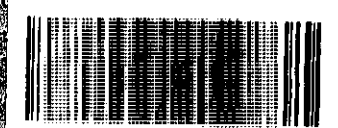
ALS Laboratory:  
please tick →

ADELAIDE 21 Gunna Road Paraola SA 5096  
Ph: 08 8359 0830 E: adelaide@alsglobal.com  
BRISBANE 32 Strand Street Stafford QLD 4053  
Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com  
GLADSTONE 46 Callamondeth Drive Clinton QLD 4680  
Ph: 07 4771 5600 E: gladstone@alsglobal.com

MACKAY 73 Harbour Road Mackay QLD 4740  
Ph: 07 4944 0177 E: mackay@alsglobal.com  
MELBOURNE 2-4 Westall Road Springvale VIC 3171  
Ph: 03 8540 0800 E: samples.melbourne@alsglobal.com  
MUDGEE 27 Sydney Road Mudgee NSW 2850  
Ph: 02 6372 6735 E: mudgee.mt@alsglobal.com

NEWCASTLE 5 Rose Gull Road Warabrook NSW 2304  
Ph: 02 4668 0133 E: samples.newcastle@alsglobal.com  
NOWRA 4/13 Geary Place North Nowra NSW 2641  
Ph: 024423 2083 E: nowra@alsglobal.com  
PERTH 10 Had Way Malaga WA 6000  
Ph: 08 9209 7655 E: samples.perth@alsglobal.com

Environmental Division  
Sydney  
Work Order  
**ES1323858**



Telephone : +61-2-8784 8555

CLIENT: ERM	TURNAROUND REQUIREMENTS : <input type="checkbox"/> Standard TAT (List due date):	FOR LABORATORY Custody Seal Date Time Signature Other Comments
OFFICE: Sydney	(Standard TAT may be longer for some tests e.g. Ultra Trace Organics) <input type="checkbox"/> Non Standard or urgent TAT (List due date):	
PROJECT: Project Symphony - MP	ALS QUOTE NO.: SY/278/13	COC SEQUENCE NUMBER (Circle)
ORDER NUMBER: 0207423		COC: ① 2 3 4 5 6 7 OF: 1 ② 3 4 5 6 7
PROJECT MANAGER: Jonathan Lekawski	CONTACT PH:	RECEIVED BY: Steven
SAMPLER: Thavone Shaw / Gavin Powell	SAMPLER MOBILE: 0435 960 035	RELINQUISHED BY: Thavone Shaw
COC emailed to ALS? ( YES / NO)	EDD FORMAT (or default): pdf/csv/esdat	DATE/TIME: 04/11/13/12:00
Email Reports to (will default to PM if no other addresses are listed): Symphony.DeltaWest@erm.com		DATE/TIME: 5/11/13 9:00
Email Invoice to (will default to PM if no other addresses are listed): Symphony.DeltaWest@erm.com		DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS		CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB, Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).										Additional Information	
	MATRIX	SAMPLE ID	DATE / TIME	TYPE & PRESERVATIVE codes below	TOTAL CONTAINERS	S-27 (6 metals- As, Cd, Cr, Cu, Ni, Pb, Zn, Hg, TRH/BTEX, PAH/Phenols)	Additional Metal - Se	TRH / BTEX / PAH / Phenol	Asbestos	VOC Scan	PCB	Particle Sizing (hydrometer), TOC -	pH, Exchangeable Cations plus ECEC			
	Soil	ML-MW05-2.0	31.10.13	1 jar, 1 bag / ICE	2											Comments on likely contamination: dilution for samples requiring specific analysis: <b>ENVIRONMENTAL SERVICES</b> <b>12 Ashley St</b> <b>Chatswood NSW 2087</b> <b>Ph: (02) 9910 6200</b> Job No: 100336 HOLD Date Received: 6/11/13 Time Received: 12:45 Received by: PW Temp: Cool/Ambient Cooling: Icepack Security: Intact/Broken/None PLEASE FORWARD TO ENV LAB.
		ML-MW05-2.9		1 jar, 2 bags / ICE	3	X	X	X	X	X	X	X	X			
		ML-MW05-5.0		1 jar	1											
		001-311013-TS		1 jar	1	X	X	X		X	X					
		001-31103-TS		2 jars	2	X	X	X		X	X					
		ML-MW05-6.0		1 large bag	1											
		ML-MW08-2.0		1 jar	1											
		ML-MW08-2.6		1 jar	1											
		ML-MW08-2.8		1 jar	1											
		ML-MW08-3.4		1 jar	1											
		ML-MW08-7.0		1 jar	1	X										
		ML-MW08-7.9		1 jar	1											
TOTAL					16	4	4	4	1	3	3	1	1			

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic  
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Specialion bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;  
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.



**Envirolab Services Pty Ltd**  
ABN 37 112 535 645  
12 Ashley St Chatswood NSW 2067  
ph 02 9910 6200 fax 02 9910 6201  
enquiries@envirolabservices.com.au  
www.envirolabservices.com.au

## **SAMPLE RECEIPT ADVICE**

### **Client:**

Environmental Resources Management Australia  
Locked Bag 24  
Broadway NSW 2007

ph: 02 8584 8888  
Fax: 02 8584 8800

Attention: Chuck Terhune, Jonathon Lekawski

### **Sample log in details:**

Your reference:	<b>0207420, Symphony - WW</b>
Envirolab Reference:	<b>100336</b>
Date received:	06/11/13
Date results expected to be reported:	<b>13/11/13</b>

Samples received in appropriate condition for analysis:	YES
No. of samples provided	1 soil
Turnaround time requested:	Standard
Temperature on receipt (°C)	6.0
Cooling Method:	Ice
Sampling Date Provided:	YES

### **Comments:**

Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples.

### **Contact details:**

Please direct any queries to Aileen Hie or Jacinta Hurst  
ph: 02 9910 6200 fax: 02 9910 6201  
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

**CERTIFICATE OF ANALYSIS**

**100352**

**Client:**

**Environmental Resources Management Australia**

Locked Bag 24

Broadway

NSW 2007

**Attention:** Chuck Terhune, Jonathon Lekawski

**Sample log in details:**

Your Reference:

**0207423, Symphony**

No. of samples:

1 soil

Date samples received / completed instructions received

06/11/13

/ 06/11/13

**Analysis Details:**

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

***Please refer to the last page of this report for any comments relating to the results.***

**Report Details:**

Date results requested by: / Issue Date:

13/11/13

/

13/11/13

Date of Preliminary Report:

Not issued

NATA accreditation number 2901. This document shall not be reproduced except in full.

Accredited for compliance with ISO/IEC 17025.

**Tests not covered by NATA are denoted with \*.**

**Results Approved By:**



Jacinta Hurst  
Laboratory Manager



vTRH(C6-C10)/BTEXN in Soil		
Our Reference:	UNITS	100352-1
Your Reference	-----	T01_281013_01_GP
Date Sampled	-----	28/10/2013
Type of sample		Soil
Date extracted	-	07/11/2013
Date analysed	-	09/11/2013
TRHC <sub>6</sub> - C <sub>9</sub>	mg/kg	<25
TRHC <sub>6</sub> - C <sub>10</sub>	mg/kg	<25
vTPHC <sub>6</sub> - C <sub>10</sub> less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
naphthalene	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	95

svTRH (C10-C40) in Soil		
Our Reference:	UNITS	100352-1
Your Reference	-----	T01_281013_01_GP
Date Sampled	-----	28/10/2013
Type of sample		Soil
Date extracted	-	07/11/2013
Date analysed	-	08/11/2013
TRHC <sub>10</sub> - C <sub>14</sub>	mg/kg	<50
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	<100
TRHC <sub>29</sub> - C <sub>36</sub>	mg/kg	<100
TRH>C <sub>10</sub> -C <sub>16</sub>	mg/kg	<50
TRH>C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	mg/kg	<50
TRH>C <sub>16</sub> -C <sub>34</sub>	mg/kg	<100
TRH>C <sub>34</sub> -C <sub>40</sub>	mg/kg	<100
Surrogate o-Terphenyl	%	83

PAHs in Soil		
Our Reference:	UNITS	100352-1
Your Reference	-----	T01_281013_01_GP
Date Sampled	-----	28/10/2013
Type of sample		Soil
Date extracted	-	07/11/2013
Date analysed	-	08/11/2013
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Benzo(a)pyrene TEQNEPMB1	mg/kg	<0.5
Total +ve PAH's	mg/kg	0.24
Surrogate p-Terphenyl-d14	%	95

Total Phenolics in Soil		
Our Reference:	UNITS	100352-1
Your Reference	-----	T01_281013_01_GP
Date Sampled	-----	28/10/2013
Type of sample		Soil
Date extracted	-	08/11/2013
Date analysed	-	08/11/2013
Total Phenolics (as Phenol)	mg/kg	<5

Acid Extractable metals in soil		
Our Reference:	UNITS	100352-1
Your Reference	-----	T01_281013_01_GP
Date Sampled	-----	28/10/2013
Type of sample		Soil
Date digested	-	07/11/2013
Date analysed	-	07/11/2013
Arsenic	mg/kg	6
Cadmium	mg/kg	<0.4
Chromium	mg/kg	13
Copper	mg/kg	15
Lead	mg/kg	19
Mercury	mg/kg	<0.1
Nickel	mg/kg	14
Zinc	mg/kg	31
Selenium	mg/kg	<2

Moisture		
Our Reference:	UNITS	100352-1
Your Reference	-----	T01_281013_01_GP
Date Sampled	-----	28/10/2013
Type of sample		Soil
Date prepared	-	7/11/2013
Date analysed	-	8/11/2013
Moisture	%	12

MethodID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note Naphthalene is determined from the VOC analysis.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Inorg-030	Total Phenolics - determined colorimetrically following disitillation, based upon APHA 22nd ED 5530 D.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105+/-5 deg C for a minimum of 12 hours.



**Client Reference: 0207423, Symphony**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
vTRH(C6-C10)/BTEXN in Soil						Base II Duplicate II %RPD		
Date extracted	-			07/11/2013	[NT]	[NT]	LCS-6	07/11/2013
Date analysed	-			08/11/2013	[NT]	[NT]	LCS-6	09/11/2013
TRHC <sub>6</sub> - C <sub>9</sub>	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-6	110%
TRHC <sub>6</sub> - C <sub>10</sub>	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-6	110%
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	LCS-6	128%
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	LCS-6	112%
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-6	99%
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	LCS-6	105%
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-6	104%
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	97	[NT]	[NT]	LCS-6	88%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
svTRH(C10-C40) in Soil						Base II Duplicate II %RPD		
Date extracted	-			07/11/2013	[NT]	[NT]	LCS-4	07/11/2013
Date analysed	-			08/11/2013	[NT]	[NT]	LCS-4	08/11/2013
TRHC <sub>10</sub> - C <sub>14</sub>	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-4	89%
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-4	99%
TRHC <sub>29</sub> - C <sub>36</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-4	79%
TRH>C <sub>10</sub> -C <sub>16</sub>	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-4	89%
TRH>C <sub>16</sub> -C <sub>34</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-4	99%
TRH>C <sub>34</sub> -C <sub>40</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-4	79%
Surrogate o-Terphenyl	%		Org-003	83	[NT]	[NT]	LCS-4	76%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Date extracted	-			07/11/2013	[NT]	[NT]	LCS-3	07/11/2013
Date analysed	-			08/11/2013	[NT]	[NT]	LCS-3	08/11/2013
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-3	115%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-3	109%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-3	99%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-3	95%

**Client Reference: 0207423, Symphony**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-3	121%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-3	98%
Benzo(b+k)fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	[NT]	[NT]	LCS-3	101%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	102	[NT]	[NT]	LCS-3	96%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Total Phenolics in Soil						Base II Duplicate II %RPD		
Date extracted	-			08/11/2013	[NT]	[NT]	LCS-1	08/11/2013
Date analysed	-			08/11/2013	[NT]	[NT]	LCS-1	08/11/2013
Total Phenolics (as Phenol)	mg/kg	5	Inorg-030	<5	[NT]	[NT]	LCS-1	97%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base II Duplicate II %RPD		
Date digested	-			07/11/2013	[NT]	[NT]	LCS-9	07/11/2013
Date analysed	-			07/11/2013	[NT]	[NT]	LCS-9	07/11/2013
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	LCS-9	112%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	[NT]	[NT]	LCS-9	115%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-9	118%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-9	118%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-9	114%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	LCS-9	91%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-9	117%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-9	117%

**Client Reference: 0207423, Symphony**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base II Duplicate II %RPD		
Selenium	mg/kg	2	Metals-020 ICP-AES	<2	[NT]	[NT]	LCS-9	112%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank				
Moisture								
Date prepared	-			[NT]				
Date analysed	-			[NT]				
Moisture	%	0.1	Inorg-008	[NT]				

**Report Comments:**

Asbestos ID was analysed by Approved Identifier: Not applicable for this job  
 Asbestos ID was authorised by Approved Signatory: Not applicable for this job

INS: Insufficient sample for this test      PQL: Practical Quantitation Limit      NT: Not tested  
 NA: Test not required                      RPD: Relative Percent Difference      NA: Test not required  
 <: Less than                                  >: Greater than                              LCS: Laboratory Control Sample

**Quality Control Definitions**

**Blank:** This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

**Duplicate:** This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

**Matrix Spike :** A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

**LCS (Laboratory Control Sample) :** This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

**Surrogate Spike:** Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

**Laboratory Acceptance Criteria**

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.



- Sydney
- Melbourne
- Brisbane
- Perth
- Hunter Valley
- North Coast
- Other

Grnd Floor, 33 Saunders Street, Pyrmont, NSW, 2009. (ph) 02 8584 8888 (fax) 02 8584 8800  
 Level 3, Yarra Tower, WTC, 18-38 Sidddeley Street, Docklands, VIC, 3005. (ph) 03 9696 8011 (fax) 03 9696 8022  
 Level 1, 60 Leichhardt Street, Spring Hill, QLD, 4004. (ph) 07 3839 8393 (fax) 07 3839 8381  
 Level 6, Grain Pool Bld, 172 St Georges Tce, WA, 6850. (ph) 08 9321 5200 (fax) 08 9321 5262  
 53 Bonville Avenue, Thornton, NSW, 2322. (ph) 02 4964 2150 (fax) 02 4964 2152  
 Suite 3/146 Gordon Street, Port Macquarie, NSW, 2444. (ph) 02 6584 7155 (fax) 02 6584 7160

Project No: 0207423  
 Project Name: *Symphony*  
 Project Location: *Mt. Piper*  
 Project Manager: *Jonathan Lekawski*  
 Sampler: *Garvin Powell*

COC Number  
**A 11729**  
 Laboratory  
**ALS**

General Analysis Requirements  
 1. Turn Around Time (please tick:  1 Day  2 Days  3 Days  Normal TAT)  
 2. Do you wish any sediment layers in water to be excluded from extractions?  
 3. Additional QA/QC reported where sample batches are < 10 samples?  
 4. % of extraneous material removed from samples to be reported as per NEPM 5.1.1?

Laboratory Number	Sample ID	Sample Depth	Sample Date	Sample Time	Matrix				Preservation				Containers (number/type)	BTEX	TPH (C6-C9 P & T) + TPH (C10-C36)	Speciated TPH	VOC Scan (USEPA 8260 List)	SVOC Scan (USEPA 8270 List)	OC/OP Pesticides	PAH	Phenols	PCB	Metals* (dissolved / total)	Asbestos	VOC Scan	HOLD	TOCH G-6
					% Sol	Water	Other	Ice	Acid	Filter	Other																
1	MK_S811_1-0		28/10		X			X				2	X	X						X	X		X	X			
2	MK_S804_0-2				X			X				2	X	X						X	X		X	X			
3	MK_S882_0-5				X			X				1											X				
4	MK_S887_1-0				X			X				1	X	X						X	X	X	X		X		
5	<del>MK_S805_0-5</del>	TRIP spike			X			X				1	X													X	
6	MK_S805_0-5				X			X				2	X	X						X	X		X	X			
7	D281015_01_CP				X			X				1	X	X						X	X		X				
8	D281013_01_CP				X			X				1	X	X						X	X		X				
9	MK_S886_0-2				X			X				2	X	X						X	X		X	X			
10	MK_S802_0-5				X			X				2	X	X						X	X		X	X			
11	ML_MW1530		28/10		X			X				1	X	X						X	X	X	X		X		
12	MK_S847_0-5		29/10		X			X				2	X	X						X	X		X	X			
13	MK_S846_1-0				X			X				2	X	X						X	X		X	X			
14	MC_MW04_0-15				X			X				2	X	X						X	X	X	X	X			
15	MK_S882_0-2				X			X				2	X	X						X	X		X	X			
16	MK_S881_1-0				X			X				2	X	X						X	X		X	X			
17	MK_S886_0-5				X			X				2	X	X						X	X		X	X			
18	MK_S876_0-5				X			X				1	X	X						X	X		X	X			
19	MK_S858_0-1				X			X				2	X	X						X	X		X	X			

Other Comments on sample  
 (eg: high voc, highly contaminated, special detection limits etc etc)  
 Subson / ... Split WO  
 Lab / Analysis: Asbestos / Newcastle  
 Organised by: ...  
 Reinspected by / Date: Envirolab  
 WDN No: 651323862  
 Batch By: PO

**EnviroLab Services**  
 12 Ashby St  
 Chatswood NSW 2047  
 Ph: (02) 9910 8200

Job No: 100352

Date Received: 5/11/13  
 Time Received: 14:30  
 Received by: PT  
 Temp: Cool Ambient  
 Cooling: Cap/Sealpack  
 Security: Intact/Broken/None

**Environmental Division Sydney**  
 Work Order  
**ES1323862**

Telephone: +61-2-8784 8555

Comments: quote # SY/278/13, email *Symphony.deltawest@erm.com*

\*Metals (circle)  
 As Cd Cr Cu Hg Ni Pb Zn Se

Relinquished by: *Garvin Powell* Signed: *[Signature]* Date/Time: *4/11/13 1515* Received by: *Steven* Date/Time: *5/11/13 9:00*  
 Relinquished by: Signed: Date/Time: Received by: *PT* Date/Time: *5/11/13 14:30*



**Envirolab Services Pty Ltd**  
ABN 37 112 535 645  
12 Ashley St Chatswood NSW 2067  
ph 02 9910 6200 fax 02 9910 6201  
enquiries@envirolabservices.com.au  
www.envirolabservices.com.au

## **SAMPLE RECEIPT ADVICE**

### **Client:**

Environmental Resources Management Australia  
Locked Bag 24  
Broadway NSW 2007

ph: 02 8584 8888  
Fax: 02 8584 8800

Attention: Chuck Terhune, Jonathon Lekawski

### **Sample log in details:**

Your reference:	<b>0207423, Symphony</b>
Envirolab Reference:	<b>100352</b>
Date received:	06/11/13
Date results expected to be reported:	<b>13/11/13</b>

Samples received in appropriate condition for analysis:	YES
No. of samples provided	1 soil
Turnaround time requested:	Standard
Temperature on receipt (°C)	7.2
Cooling Method:	Ice
Sampling Date Provided:	YES

### **Comments:**

Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples.

### **Contact details:**

Please direct any queries to Aileen Hie or Jacinta Hurst  
ph: 02 9910 6200 fax: 02 9910 6201  
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au



- Sydney
- Melbourne
- Brisbane
- Perth
- Hunter Valley
- North Coast
- Other

Gnd Floor, 33 Saunders Street, Pyrmont, NSW, 2009. (ph) 02 8584 8868 (fax) 02 8584 8800  
 Level 3, Yarra Tower, WTC, 18-38 Siddeley Street, Docklands, VIC, 3005. (ph) 03 9696 8011 (fax) 03 9696 8022  
 Level 1, 60 Leichhardt Street, Spring Hill, QLD, 4004. (ph) 07 3839 8393 (fax) 07 3839 8381  
 Level 6, Grain Pool Bld, 172 St Georges Tce, WA, 6850. (ph) 08 9321 5200 (fax) 08 9321 5262  
 53 Bonville Avenue, Thornton, NSW, 2322. (ph) 02 4964 2150 (fax) 02 4964 2152  
 Suite 3/146 Gordon Street, Port Macquarie, NSW, 2444. (ph) 02 6584 7155 (fax) 02 6584 7160

*Enrich*

Project No: **0207423**

Project Name: **Symphony**

Project Location: **M4 Piper**

Project Manager: **Jonathan Lekanowski**

Sampler: **Gavin Powell**

COC Number  
**A 11731**

Laboratory  
**ALS**

Other Comments on sample  
(eg: high voc, highly contaminated, special detection limits etc etc)

General Analysis Requirements

1. Turn Around Time (please tick:  1 Day  2 Days  3 Days  Normal TAT)

2. Do you wish any sediment layers in water to be excluded from extractions?

3. Additional QA/QC reported where sample batches are < 10 samples?

4. % of extraneous material removed from samples to be reported as per NEPM 5.1.1?

Laboratory Number	Sample ID	Sample Depth	Sample Date	Sample Time	Matrix			Preservation				Containers (number/type)	BTEX	TPH (C8-C9 P & T) + TPH (C10-C36)	Speciated TPH	VOC Scan (USEPA 8260 List)	SVOC Scan (USEPA 8270 List)	OC OP Pesticides	PAH	Phenols	PCB	Metals* (dissolved / total)	VOC Scan	HOLD
					Soil	Water	Other	Ice	Acid	Filter	Other													
1	MK-SB82-3-9		6/11		X		X						X	X				X	X			X		
2	MK-SB81-3-0											X	X					X	X			X		
3	MK-SB76-3-0											X	X					X	X	X	X	X		
4	MK-SB86-1-5											X	X					X	X			X		
5	MK-SB86-3-9																						X	
6	MK-SB28-2-0												X	X				X	X	X	X	X		
7	MK-SB28-3-0																	X	X	X	X	X		
8	MK-SB35-1-0											X	X					X	X	X	X	X		
9	MK-SB35-3-0																						X	
10	MK-SB34-2-0																	X	X		X			
11	MK-SB34-3-9												X	X				X	X		X			
12	D-0611B-01-09											X	X					X	X		X			
13	MK-SB33-1-5											X	X					X	X		X			
14	MK-SB32-1-8		6/11			X		X														X		
15	MK-SB22-1-5		6/11			X		X				X	X					X	X	X	X	X		
16	MK-SB58-2-0		7/11			X		X				X	X					X	X		X			
17	MK-SB58-3-9					X		X														X		
18	MK-SB40-1-5					X		X														X		

Environmental Division  
Sydney  
Work Order  
**ES1324470**



Telephone: +61-2-8784 8555

Subcon / Forward Lab Split W/O  
 Lab / Analysis: **Asbestos Newcastle**  
 Organised By / Date: **MIS-01-01-09/10/10**  
 Relinquished By / Date: **---**  
 Connote / Courier: **---**  
 WO No: **ES1324470**  
 Attach By PO / Internal Sheet: **---**

**ENVIRONMENTAL**  
17 Ashley St.  
Chatswood NSW 2067  
Ph: (02) 8340 6200

Job No: **100765**  
 Date Received: **13/11**  
 Time Received: **13:00**  
 Received by: **[Signature]**  
 Temp: **Cool/Ambient**  
 Cooling: **Lead Cap/Seal**  
 Security: **Intact/Broken/None**

Comments: **quote # SY/278/13, email [symphony.delta.nest@erm.com](mailto:symphony.delta.nest@erm.com)**

Metals (circle)  
As Cd Cr Cu Hg Ni Pb Zn **Se**

Relinquished by: \_\_\_\_\_ Signed: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Received by: **[Signature]** Date/Time: **12/1/13 9:30**

Relinquished by: \_\_\_\_\_ Signed: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Received by: **Sophie** Date/Time: **12/1/13**



**CERTIFICATE OF ANALYSIS**

**100765**

**Client:**

**Environmental Resources Management Australia**

Locked Bag 24

Broadway

NSW 2007

**Attention:** Chuck Terhune, Jonathon Lekawski

**Sample log in details:**

Your Reference:

**0207423, Symphony**

No. of samples:

1 Soil

Date samples received / completed instructions received

13/11/13

/ 13/11/13

**Analysis Details:**

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

***Please refer to the last page of this report for any comments relating to the results.***

**Report Details:**

Date results requested by: / Issue Date:

20/11/13

/

19/11/13

Date of Preliminary Report:

Not issued

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Accredited for compliance with ISO/IEC 17025.

**Tests not covered by NATA are denoted with \*.**

**Results Approved By:**



Jacinta Hurst  
Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference:	UNITS	100765-1
Your Reference	-----	T_061113_01 _GP
Date Sampled	-----	06/11/2013
Type of sample		Soil
Date extracted	-	14/11/2013
Date analysed	-	15/11/2013
TRHC <sub>6</sub> - C <sub>9</sub>	mg/kg	<25
TRHC <sub>6</sub> - C <sub>10</sub>	mg/kg	<25
vTPHC <sub>6</sub> - C <sub>10</sub> less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
naphthalene	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	87

svTRH (C10-C40) in Soil		
Our Reference:	UNITS	100765-1
Your Reference	-----	T_061113_01 _GP
Date Sampled	-----	06/11/2013
Type of sample		Soil
Date extracted	-	14/11/2013
Date analysed	-	14/11/2013
TRHC <sub>10</sub> - C <sub>14</sub>	mg/kg	<50
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	<100
TRHC <sub>29</sub> - C <sub>36</sub>	mg/kg	<100
TRH>C <sub>10</sub> -C <sub>16</sub>	mg/kg	<50
TRH>C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	mg/kg	<50
TRH>C <sub>16</sub> -C <sub>34</sub>	mg/kg	<100
TRH>C <sub>34</sub> -C <sub>40</sub>	mg/kg	<100
Surrogate o-Terphenyl	%	91

PAHs in Soil		
Our Reference:	UNITS	100765-1
Your Reference	-----	T_061113_01 _GP
Date Sampled	-----	06/11/2013
Type of sample		Soil
Date extracted	-	14/11/2013
Date analysed	-	15/11/2013
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Benzo(a)pyrene TEQNEPMB1	mg/kg	<0.5
Total +ve PAH's	mg/kg	NIL (+)VE
Surrogate p-Terphenyl-d14	%	97

Total Phenolics in Soil		
Our Reference:	UNITS	100765-1
Your Reference	-----	T_061113_01 _GP
Date Sampled	-----	06/11/2013
Type of sample		Soil
Date extracted	-	14/11/2013
Date analysed	-	14/11/2013
Total Phenolics (as Phenol)	mg/kg	<5

Acid Extractable metals in soil		
Our Reference:	UNITS	100765-1
Your Reference	-----	T_061113_01 _GP
Date Sampled	-----	06/11/2013
Type of sample		Soil
Date digested	-	14/11/2013
Date analysed	-	15/11/2013
Arsenic	mg/kg	9
Cadmium	mg/kg	<0.4
Chromium	mg/kg	11
Copper	mg/kg	13
Lead	mg/kg	14
Mercury	mg/kg	<0.1
Nickel	mg/kg	28
Zinc	mg/kg	45
Selenium	mg/kg	<2

Moisture		
Our Reference:	UNITS	100765-1
Your Reference	-----	T_061113_01
		_GP
Date Sampled	-----	06/11/2013
Type of sample		Soil
Date prepared	-	14/11/2013
Date analysed	-	15/11/2013
Moisture	%	22



MethodID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note Naphthalene is determined from the VOC analysis.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Inorg-030	Total Phenolics - determined colorimetrically following disitillation, based upon APHA 22nd ED 5530 D.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105+/-5 deg C for a minimum of 12 hours.

**Client Reference: 0207423, Symphony**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
vTRH(C6-C10)/BTEXN in Soil						Base II Duplicate II %RPD		
Date extracted	-			14/11/2013	[NT]	[NT]	LCS-3	14/11/2013
Date analysed	-			15/11/2013	[NT]	[NT]	LCS-3	15/11/2013
TRHC <sub>6</sub> - C <sub>9</sub>	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-3	98%
TRHC <sub>6</sub> - C <sub>10</sub>	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-3	98%
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	LCS-3	96%
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	LCS-3	97%
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-3	95%
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	LCS-3	104%
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-3	104%
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	95	[NT]	[NT]	LCS-3	95%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
svTRH(C10-C40) in Soil						Base II Duplicate II %RPD		
Date extracted	-			14/11/2013	[NT]	[NT]	LCS-3	14/11/2013
Date analysed	-			14/11/2013	[NT]	[NT]	LCS-3	14/11/2013
TRHC <sub>10</sub> - C <sub>14</sub>	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-3	91%
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-3	109%
TRHC <sub>29</sub> - C <sub>36</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-3	89%
TRH>C <sub>10</sub> -C <sub>16</sub>	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-3	91%
TRH>C <sub>16</sub> -C <sub>34</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-3	109%
TRH>C <sub>34</sub> -C <sub>40</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-3	89%
Surrogate o-Terphenyl	%		Org-003	91	[NT]	[NT]	LCS-3	84%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Date extracted	-			14/11/2013	[NT]	[NT]	LCS-3	14/11/2013
Date analysed	-			15/11/2013	[NT]	[NT]	LCS-3	15/11/2013
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-3	107%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-3	106%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-3	104%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-3	104%

**Client Reference: 0207423, Symphony**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-3	108%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-3	99%
Benzo(b+k)fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	[NT]	[NT]	LCS-3	107%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	99	[NT]	[NT]	LCS-3	101%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Total Phenolics in Soil						Base II Duplicate II %RPD		
Date extracted	-			14/11/2013	[NT]	[NT]	LCS-1	14/11/2013
Date analysed	-			14/11/2013	[NT]	[NT]	LCS-1	14/11/2013
Total Phenolics (as Phenol)	mg/kg	5	Inorg-030	<5	[NT]	[NT]	LCS-1	96%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base II Duplicate II %RPD		
Date digested	-			14/11/2013	[NT]	[NT]	LCS-7	14/11/2013
Date analysed	-			15/11/2013	[NT]	[NT]	LCS-7	15/11/2013
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	LCS-7	103%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	[NT]	[NT]	LCS-7	112%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-7	111%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-7	109%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-7	107%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	LCS-7	97%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-7	109%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-7	108%

**Client Reference: 0207423, Symphony**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base II Duplicate II %RPD		
Selenium	mg/kg	2	Metals-020 ICP-AES	<2	[NT]	[NT]	LCS-7	105%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank				
Moisture								
Date prepared	-			[NT]				
Date analysed	-			[NT]				
Moisture	%	0.1	Inorg-008	[NT]				

**Report Comments:**

Asbestos ID was analysed by Approved Identifier: Not applicable for this job  
 Asbestos ID was authorised by Approved Signatory: Not applicable for this job

INS: Insufficient sample for this test      PQL: Practical Quantitation Limit      NT: Not tested  
 NA: Test not required                      RPD: Relative Percent Difference      NA: Test not required  
 <: Less than                                  >: Greater than                              LCS: Laboratory Control Sample

**Quality Control Definitions**

**Blank:** This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

**Duplicate:** This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

**Matrix Spike :** A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

**LCS (Laboratory Control Sample) :** This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

**Surrogate Spike:** Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

**Laboratory Acceptance Criteria**

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.



**Envirolab Services Pty Ltd**  
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www.envirolabservices.com.au

## **SAMPLE RECEIPT ADVICE**

### **Client:**

Environmental Resources Management Australia  
Locked Bag 24  
Broadway NSW 2007

ph: 02 8584 8888  
Fax: 02 8584 8800

Attention: Chuck Terhune, Jonathon Lekawski

### **Sample log in details:**

Your reference:	<b>0207423, Symphony</b>
Envirolab Reference:	<b>100765</b>
Date received:	13/11/13
Date results expected to be reported:	<b>20/11/13</b>

Samples received in appropriate condition for analysis:	YES
No. of samples provided	1 Soil
Turnaround time requested:	Standard
Temperature on receipt (°C)	3.3
Cooling Method:	Ice
Sampling Date Provided:	YES

### **Comments:**

Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples.

### **Contact details:**

Please direct any queries to Aileen Hie or Jacinta Hurst  
ph: 02 9910 6200 fax: 02 9910 6201  
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

**CERTIFICATE OF ANALYSIS**

**100834**

**Client:**

**Environmental Resources Management Australia**

Locked Bag 24

Broadway

NSW 2007

**Attention:** Gavin Powell, Jonathon Lekawski

**Sample log in details:**

Your Reference:	<b>0207420, Symphony - MP</b>
No. of samples:	1 soil
Date samples received / completed instructions received	14/11/13 / 14/11/13

**Analysis Details:**

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

***Please refer to the last page of this report for any comments relating to the results.***

**Report Details:**

Date results requested by: / Issue Date: 21/11/13 / 21/11/13

Date of Preliminary Report: Not issued

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Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with \*.**

**Results Approved By:**



Jacinta Hurst  
Laboratory Manager



VOCs in soil Our Reference: Your Reference	UNITS -----	100834-1 T01_071113_ TS
Date Sampled Type of sample	-----	07/11/2013 Soil
Date extracted	-	15/11/2013
Date analysed	-	16/11/2013
Dichlorodifluoromethane	mg/kg	<1
Chloromethane	mg/kg	<1
Vinyl Chloride	mg/kg	<1
Bromomethane	mg/kg	<1
Chloroethane	mg/kg	<1
Trichlorofluoromethane	mg/kg	<1
1,1-Dichloroethene	mg/kg	<1
trans-1,2-dichloroethene	mg/kg	<1
1,1-dichloroethane	mg/kg	<1
cis-1,2-dichloroethene	mg/kg	<1
bromochloromethane	mg/kg	<1
chloroform	mg/kg	<1
2,2-dichloropropane	mg/kg	<1
1,2-dichloroethane	mg/kg	<1
1,1,1-trichloroethane	mg/kg	<1
1,1-dichloropropene	mg/kg	<1
Cyclohexane	mg/kg	<1
carbon tetrachloride	mg/kg	<1
Benzene	mg/kg	<0.2
dibromomethane	mg/kg	<1
1,2-dichloropropane	mg/kg	<1
trichloroethene	mg/kg	<1
bromodichloromethane	mg/kg	<1
trans-1,3-dichloropropene	mg/kg	<1
cis-1,3-dichloropropene	mg/kg	<1
1,1,2-trichloroethane	mg/kg	<1
Toluene	mg/kg	<0.5
1,3-dichloropropane	mg/kg	<1
dibromochloromethane	mg/kg	<1
1,2-dibromoethane	mg/kg	<1
tetrachloroethene	mg/kg	<1
1,1,1,2-tetrachloroethane	mg/kg	<1
chlorobenzene	mg/kg	<1
Ethylbenzene	mg/kg	<1
bromoform	mg/kg	<1
m+p-xylene	mg/kg	<2
styrene	mg/kg	<1
1,1,2,2-tetrachloroethane	mg/kg	<1
o-Xylene	mg/kg	<1

VOCs in soil Our Reference: Your Reference	UNITS -----	100834-1 T01_071113_ TS
Date Sampled Type of sample	-----	07/11/2013 Soil
1,2,3-trichloropropane	mg/kg	<1
isopropylbenzene	mg/kg	<1
bromobenzene	mg/kg	<1
n-propyl benzene	mg/kg	<1
2-chlorotoluene	mg/kg	<1
4-chlorotoluene	mg/kg	<1
1,3,5-trimethyl benzene	mg/kg	<1
tert-butyl benzene	mg/kg	<1
1,2,4-trimethyl benzene	mg/kg	<1
1,3-dichlorobenzene	mg/kg	<1
sec-butyl benzene	mg/kg	<1
1,4-dichlorobenzene	mg/kg	<1
4-isopropyl toluene	mg/kg	<1
1,2-dichlorobenzene	mg/kg	<1
n-butyl benzene	mg/kg	<1
1,2-dibromo-3-chloropropane	mg/kg	<1
1,2,4-trichlorobenzene	mg/kg	<1
hexachlorobutadiene	mg/kg	<1
1,2,3-trichlorobenzene	mg/kg	<1
Surrogate Dibromofluorometha	%	119
Surrogate aaa-Trifluorotoluene	%	109
Surrogate Toluene-d8	%	93
Surrogate 4-Bromofluorobenzene	%	101

vTRH(C6-C10)/BTEX in Soil		
Our Reference:	UNITS	100834-1
Your Reference	-----	T01_071113_
		TS
Date Sampled	-----	07/11/2013
Type of sample		Soil
Date extracted	-	15/11/2013
Date analysed	-	16/11/2013
TRHC <sub>6</sub> - C <sub>9</sub>	mg/kg	<25
TRHC <sub>6</sub> - C <sub>10</sub>	mg/kg	<25
vTPHC <sub>6</sub> - C <sub>10</sub> less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
naphthalene	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	109

svTRH (C10-C40) in Soil		
Our Reference:	UNITS	100834-1
Your Reference	-----	T01_071113_
		TS
Date Sampled	-----	07/11/2013
Type of sample		Soil
Date extracted	-	15/11/2013
Date analysed	-	18/11/2013
TRHC <sub>10</sub> - C <sub>14</sub>	mg/kg	<50
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	<100
TRHC <sub>29</sub> - C <sub>36</sub>	mg/kg	<100
TRH>C <sub>10</sub> -C <sub>16</sub>	mg/kg	<50
TRH>C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	mg/kg	<50
TRH>C <sub>16</sub> -C <sub>34</sub>	mg/kg	<100
TRH>C <sub>34</sub> -C <sub>40</sub>	mg/kg	<100
Surrogate o-Terphenyl	%	91

PAHs in Soil		
Our Reference:	UNITS	100834-1
Your Reference	-----	T01_071113_
		TS
Date Sampled	-----	07/11/2013
Type of sample		Soil
Date extracted	-	15/11/2013
Date analysed	-	16/11/2013
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Benzo(a)pyrene TEQNEPMB1	mg/kg	<0.5
Total +ve PAH's	mg/kg	0.10
Surrogate p-Terphenyl-d14	%	101

PCBs in Soil		
Our Reference:	UNITS	100834-1
Your Reference	-----	T01_071113_
		TS
Date Sampled	-----	07/11/2013
Type of sample		Soil
Date extracted	-	15/11/2013
Date analysed	-	15/11/2013
Arochlor 1016	mg/kg	<0.1
Arochlor 1221	mg/kg	<0.1
Arochlor 1232	mg/kg	<0.1
Arochlor 1242	mg/kg	<0.1
Arochlor 1248	mg/kg	<0.1
Arochlor 1254	mg/kg	<0.1
Arochlor 1260	mg/kg	<0.1
Surrogate TCLMX	%	79

Total Phenolics in Soil		
Our Reference:	UNITS	100834-1
Your Reference	-----	T01_071113_
		TS
Date Sampled	-----	07/11/2013
Type of sample		Soil
Date extracted	-	14/11/2013
Date analysed	-	14/11/2013
Total Phenolics (as Phenol)	mg/kg	<5



Acid Extractable metals in soil		
Our Reference:	UNITS	100834-1
Your Reference	-----	T01_071113_
		TS
Date Sampled	-----	07/11/2013
Type of sample		Soil
Date digested	-	15/11/2013
Date analysed	-	18/11/2013
Arsenic	mg/kg	7
Cadmium	mg/kg	<0.4
Chromium	mg/kg	10
Copper	mg/kg	20
Lead	mg/kg	20
Mercury	mg/kg	<0.1
Nickel	mg/kg	25
Zinc	mg/kg	99
Selenium	mg/kg	<2

Moisture		
Our Reference:	UNITS	100834-1
Your Reference	-----	T01_071113_
		TS
Date Sampled	-----	07/11/2013
Type of sample		Soil
Date prepared	-	15/11/2013
Date analysed	-	18/11/2013
Moisture	%	21

MethodID	Methodology Summary
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note Naphthalene is determined from the VOC analysis.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Inorg-030	Total Phenolics - determined colorimetrically following distillation, based upon APHA 22nd ED 5530 D.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105+/-5 deg C for a minimum of 12 hours.

Client Reference: 0207420, Symphony - MP

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
VOCs in soil						Base II Duplicate II %RPD		
Date extracted	-			15/11/2013	[NT]	[NT]	LCS-2	15/11/2013
Date analysed	-			16/11/2013	[NT]	[NT]	LCS-2	16/11/2013
Dichlorodifluoromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Chloromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Vinyl Chloride	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Bromomethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Chloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Trichlorofluoromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
1,1-Dichloroethene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
trans-1,2-dichloroethene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
1,1-dichloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	LCS-2	104%
cis-1,2-dichloroethene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
bromochloromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
chloroform	mg/kg	1	Org-014	<1	[NT]	[NT]	LCS-2	119%
2,2-dichloropropane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
1,2-dichloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	LCS-2	116%
1,1,1-trichloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	LCS-2	110%
1,1-dichloropropene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Cyclohexane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
carbon tetrachloride	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Benzene	mg/kg	0.2	Org-014	<0.2	[NT]	[NT]	[NR]	[NR]
dibromomethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
1,2-dichloropropane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
trichloroethene	mg/kg	1	Org-014	<1	[NT]	[NT]	LCS-2	80%
bromodichloromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	LCS-2	107%
trans-1,3-dichloropropene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
cis-1,3-dichloropropene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
1,1,2-trichloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Toluene	mg/kg	0.5	Org-014	<0.5	[NT]	[NT]	[NR]	[NR]
1,3-dichloropropane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
dibromochloromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	LCS-2	109%
1,2-dibromoethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
tetrachloroethene	mg/kg	1	Org-014	<1	[NT]	[NT]	LCS-2	110%
1,1,1,2-tetrachloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
chlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Ethylbenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
bromoform	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
m+p-xylene	mg/kg	2	Org-014	<2	[NT]	[NT]	[NR]	[NR]
styrene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
1,1,2,2-tetrachloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
o-Xylene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
1,2,3-trichloropropane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]

Client Reference: 0207420, Symphony - MP

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
VOCs in soil						Base II Duplicate II %RPD		
isopropylbenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
bromobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
n-propyl benzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
2-chlorotoluene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
4-chlorotoluene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
1,3,5-trimethyl benzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
tert-butyl benzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
1,2,4-trimethyl benzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
1,3-dichlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
sec-butyl benzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
1,4-dichlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
4-isopropyl toluene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
1,2-dichlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
n-butyl benzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
1,2-dibromo-3-chloropropane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
1,2,4-trichlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
hexachlorobutadiene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
1,2,3-trichlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Surrogate Dibromofluorometha	%		Org-014	119	[NT]	[NT]	LCS-2	126%
Surrogate aaa-Trifluorotoluene	%		Org-014	118	[NT]	[NT]	LCS-2	116%
Surrogate Toluene-d8	%		Org-014	93	[NT]	[NT]	LCS-2	94%
Surrogate 4-Bromofluorobenzene	%		Org-014	60	[NT]	[NT]	LCS-2	98%

**Client Reference: 0207420, Symphony - MP**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
vTRH(C6-C10)/BTEXN in Soil						Base II Duplicate II %RPD		
Date extracted	-			15/11/2013	[NT]	[NT]	LCS-2	15/11/2013
Date analysed	-			16/11/2013	[NT]	[NT]	LCS-2	16/11/2013
TRHC <sub>6</sub> - C <sub>9</sub>	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-2	94%
TRHC <sub>6</sub> - C <sub>10</sub>	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-2	94%
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	LCS-2	95%
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	LCS-2	87%
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-2	95%
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	LCS-2	97%
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-2	105%
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	118	[NT]	[NT]	LCS-2	100%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
svTRH(C10-C40) in Soil						Base II Duplicate II %RPD		
Date extracted	-			15/11/2013	[NT]	[NT]	LCS-2	15/11/2013
Date analysed	-			18/11/2013	[NT]	[NT]	LCS-2	18/11/2013
TRHC <sub>10</sub> - C <sub>14</sub>	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-2	103%
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-2	111%
TRHC <sub>29</sub> - C <sub>36</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-2	93%
TRH>C <sub>10</sub> -C <sub>16</sub>	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-2	103%
TRH>C <sub>16</sub> -C <sub>34</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-2	111%
TRH>C <sub>34</sub> -C <sub>40</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-2	93%
Surrogate o-Terphenyl	%		Org-003	90	[NT]	[NT]	LCS-2	111%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Date extracted	-			15/11/2013	[NT]	[NT]	LCS-2	15/11/2013
Date analysed	-			16/11/2013	[NT]	[NT]	LCS-2	16/11/2013
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-2	110%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-2	107%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-2	104%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-2	103%

**Client Reference: 0207420, Symphony - MP**

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-2	107%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-2	102%
Benzo(b+k)fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	[NT]	[NT]	LCS-2	105%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	107	[NT]	[NT]	LCS-2	103%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PCBs in Soil						Base II Duplicate II %RPD		
Date extracted	-			15/11/2013	[NT]	[NT]	LCS-2	15/11/2013
Date analysed	-			15/11/2013	[NT]	[NT]	LCS-2	15/11/2013
Arochlor 1016	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1221	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1232	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1242	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1248	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1254	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	LCS-2	89%
Arochlor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%		Org-006	84	[NT]	[NT]	LCS-2	77%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Total Phenolics in Soil						Base II Duplicate II %RPD		
Date extracted	-			14/11/2013	[NT]	[NT]	LCS-1	14/11/2013
Date analysed	-			14/11/2013	[NT]	[NT]	LCS-1	14/11/2013
Total Phenolics (as Phenol)	mg/kg	5	Inorg-030	<5	[NT]	[NT]	LCS-1	95%



**Client Reference: 0207420, Symphony - MP**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base II Duplicate II %RPD		
Date digested	-			15/11/2013	[NT]	[NT]	LCS-11	15/11/2013
Date analysed	-			15/11/2013	[NT]	[NT]	LCS-11	15/11/2013
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	LCS-11	105%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	[NT]	[NT]	LCS-11	111%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-11	109%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-11	106%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-11	106%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	LCS-11	95%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-11	108%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-11	107%
Selenium	mg/kg	2	Metals-020 ICP-AES	<2	[NT]	[NT]	LCS-11	107%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank				
Moisture								
Date prepared	-			[NT]				
Date analysed	-			[NT]				
Moisture	%	0.1	Inorg-008	[NT]				

**Report Comments:**

Asbestos ID was analysed by Approved Identifier: Not applicable for this job  
 Asbestos ID was authorised by Approved Signatory: Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

**Quality Control Definitions**

**Blank:** This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

**Duplicate:** This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

**Matrix Spike :** A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

**LCS (Laboratory Control Sample) :** This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

**Surrogate Spike:** Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

**Laboratory Acceptance Criteria**

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

515-16



**CHAIN OF CUSTODY**

ALS Laboratory:  
please tick →

JADELAIDE 21 Burma Road Port Adelaide SA 5095  
Ph. 08 8359 0890 E. adelaide@alsglobal.com  
LIBRISBANE 32 Shand Street Stafford QLD 4053  
Ph. 07 3243 7222 E. samples.lnsbane@alsglobal.com  
GLADSTONE 46 Callomondah Drive Clinton QLD 4680  
Ph. 07 7471 6000 E. gladstone@alsglobal.com

URMAGRAY 77 Hindmarsh Road Macleay QLD 4740  
Ph. 07 4643 7777 E. urmagray@alsglobal.com  
MELBOURNE 2-4 Westall Road Spangvale VIC 3171  
Ph. 03 9300 6005 E. samples.melbourne@alsglobal.com  
LIMMUDGEE 272000 Highway 3333 Mudgee NSW 2850  
Ph. 02 6222 6724 E. mudgee@alsglobal.com  
SYDNEY 277 259 Woodman Road Smithfield NSW 2164  
Ph. 02 8714 8555 E. samples.sydney@alsglobal.com  
TOWNSVILLE 14-15 Deanna Court Betha QLD 4918  
Ph. 07 4704 0600 E. townsville.environmental@alsglobal.com

Relinquished by / Date: 11/11/15

SYDNEY 277 259 Woodman Road Smithfield NSW 2164  
Ph. 02 8714 8555 E. samples.sydney@alsglobal.com  
TOWNSVILLE 14-15 Deanna Court Betha QLD 4918  
Ph. 07 4704 0600 E. townsville.environmental@alsglobal.com

**Environmental Division  
Sydney  
Work Order  
ES1324473**



Telephone : +61-2-8784 8555

CLIENT: <b>ERM</b>	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	<input type="checkbox"/> Standard TAT (List due date) <input checked="" type="checkbox"/> Non-Standard or urgent TAT (List due date):
OFFICE: <b>Sydney</b>	ALS QUOTE NO.: <b>SY127813</b>	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7
PROJECT: <b>Project Symphony - MP</b>	ORDER NUMBER: <b>0207423</b>	PROJECT MANAGER: <b>Jonathan Lekawski</b>
SAMPLER: <b>Thavone Shaw / Gavin Powell</b>	SAMPLER MOBILE: <b>0435 960 035</b>	RECEIVED BY: <b>Da..</b>
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): <b>pdf/csv/esdat</b>	RELINQUISHED BY: <b>Thavone Shaw</b>
Email Reports to (will default to PM if no other addresses are listed): <b>Symphony.DeltaWest@erm.com</b>	DATE/TIME: <b>11.11.13 / 15:00</b>	DATE/TIME: <b>12/11 083-</b>
Email Invoice to (will default to PM if no other addresses are listed): <b>Symphony.DeltaWest@erm.com</b>		

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below)	TOTAL CONTAINERS	ANALYSIS REQUIRED including SUITES (NB, Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).										Additional Information		
						S-27 (8 metals - As, Cd, Cr, Cu, Ni, Pb, Zn, Hg, TRH/BTEX, PAH/Phenols)	Additional Metal - Se	TRH / BTEX / PAH / Phenol	Asbestos	VOC Scan	PCB	Particle Sizing (hydrometer), TOC - (0.5% max for 0.5)	pH, Exchangeable Cations plus ECEC	TRH/BTEX				
1	Trip Spike 2	31.10.13	Soil	Jar	1													
2	Trip Blank	4.11.13	"	"	1													
3	MK-SB49-02	7.11.13/0845		1 bag Jar	2													HOLD
4	MK-SB49-0.5	08:50		1 bag Jar	2	X	X	X	X	X	X							
5	DOI-071113-TS			Jar	1	X	X	X										
6	MK-SB49-0.9	09:20		1 bag Jar	1													HOLD
7	MK-SB65-02	10:15		1 bag Jar	2													HOLD
8	MK-SB65-0.5			"	2													
9	MK-SB65-1.0	10:45		Jar	1	X	X	X										
10	MK-SB72-0.2	13:10		Jar, 1 bag	2	X	X	X										HOLD
11	MK-SB72-0.5	13:20		"	2	X	X	X	X									
TOTAL					18	5	5	5	3	3	3							

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic  
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;  
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.





**Envirolab Services Pty Ltd**  
ABN 37 112 535 645  
12 Ashley St Chatswood NSW 2067  
ph 02 9910 6200 fax 02 9910 6201  
enquiries@envirolabservices.com.au  
www.envirolabservices.com.au

## **SAMPLE RECEIPT ADVICE**

### **Client:**

Environmental Resources Management Australia  
Locked Bag 24  
Broadway NSW 2007

ph: 02 8584 8888

Fax: 02 8584 8800

Attention: Gavin Powell, Jonathon Lekawski

### **Sample log in details:**

Your reference:

**0207420, Symphony - MP**

Envirolab Reference:

**100834**

Date received:

14/11/13

Date results expected to be reported:

**21/11/13**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	1 soil
Turnaround time requested:	Standard
Temperature on receipt (°C)	4.1
Cooling Method:	Ice
Sampling Date Provided:	YES

### **Comments:**

Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples.

### **Contact details:**

Please direct any queries to Aileen Hie or Jacinta Hurst

ph: 02 9910 6200 fax: 02 9910 6201

email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

**ALS** Laboratory  
 12 Ashby St  
 Chatswood NSW 2067  
 Ph: (02) 9510 6200  
 Fax: (02) 9510 6200  
 Email: info@als.com.au

**CHAIN OF CUSTODY**

CLIENT: ERM  
 OFFICE: GROUND FLOOR, 33 SAUNDERS ST, PYRMONT NSW 2009  
 PROJECT: Mt Piper Soils

ORDER NUMBER: 0207423  
 PROJECT MANAGER: Jonathan Lejanski  
 SAMPLER: Thayne Shaw  
 COG emailed to ALS? (YES / NO)  
 Email Reports to (will default to PM if no other addresses are listed): Symphony.DeltaWest@erm.com  
 Email Invoice to (will default to PM if no other addresses are listed): Symphony.DeltaWest@erm.com

TURNAROUND REQUIREMENTS:  
 Standard TAT (List due date)  
 Non Standard or urgent TAT (List due date)  
 (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)

ALS QUOTE NO.: 51/27813

CONTACT PH:  
 SAMPLER MOBILE:  
 EDD FORMAT (or default):  
 COG emailed to ALS? (YES / NO)  
 Email Reports to (will default to PM if no other addresses are listed): Symphony.DeltaWest@erm.com  
 Email Invoice to (will default to PM if no other addresses are listed): Symphony.DeltaWest@erm.com

FOR LABORATORY USE ONLY (Check)  
 Cuscuty Seal (Yes/No)  
 Free Ice / frozen Ice (Yes/No)  
 Random Sample Temperature on Receipt  
 Other Comments

RECEIVED BY: *PLW (ELS)*  
 DATE/TIME: 14/10/13 12:45

RELINQUISHED BY: *David*  
 DATE/TIME: 11/10 08:30

**ANALYSIS REQUIRED INCLUDING SUITES (NB. Suite Codes must be listed to affect suite price)**  
 Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).

**CONTAINER INFORMATION**

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (to codes below)	(refer TOTAL CONTAINERS)	S-27 (8 metals - As, Cd, Cr, Cu, Ni, Pb, PAH/Phenols)	Additional Metal - Se	Asbestos	VOC Scan	PCB	Particle Sizing, TOC (Hydrometric), TOC	PH, Exchangeable Cations plus ECEC	Comments on likely contaminant levels, dilutions, or samples requiring specific GC analysis etc.
1	MI_SB07_0.2	8-Oct-13	Soil	Ice	2	X	X	X					HOLD
2	ME_MW04_0.2	8-Oct-13	Soil	Ice	2	X	X	X					HOLD
3	ME_MW04_0.5	8-Oct-13	Soil	Ice	1	X	X	X					HOLD
4	ME_MW05_0.2	9-Oct-13	Soil	Ice	2	X	X	X					HOLD
5	ME_MW05_0.5	9-Oct-13	Soil	Ice	1	X	X	X					HOLD
6	ME_MW05_1.0	9-Oct-13	Soil	Ice	1	X	X	X					HOLD
7	ME_MW08_0.2	9-Oct-13	Soil	Ice	2	X	X	X					HOLD
8	ME_MW08_0.5	9-Oct-13	Soil	Ice	1	X	X	X					HOLD
9	ME_MW01_0.2	9-Oct-13	Soil	Ice	2	X	X	X					HOLD
10	ME_MW03_0.2	9-Oct-13	Soil	Ice	2	X	X	X					HOLD
11	ME_MW03_0.5	9-Oct-13	Soil	Ice	1	X	X	X					HOLD
12	ME_MW03_1.0	9-Oct-13	Soil	Ice	1	X	X	X					HOLD
13	MI_SB04_0.2	9-Oct-13	Soil	Ice	1	X	X	X					HOLD
14	ME_MW02_0.2	9-Oct-13	Soil	Ice	1	X	X	X					HOLD
15	DM1_091013_TS	9-Oct-13	Soil	Ice	1	X	X	X					HOLD
16	DM2_091013_TS	9-Oct-13	Soil	Ice	1	X	X	X					HOLD
17	T01_091013_TS	9-Oct-13	Soil	Ice	2								

**RECEIVED BY:** *PLW (ELS)*  
**DATE/TIME:** 14/10/13 12:45

**RELINQUISHED BY:** *David*  
**DATE/TIME:** 11/10 08:30

**FOR LABORATORY USE ONLY (Check)**  
 Cuscuty Seal (Yes/No)  
 Free Ice / frozen Ice (Yes/No)  
 Random Sample Temperature on Receipt  
 Other Comments

**ANALYSIS REQUIRED INCLUDING SUITES (NB. Suite Codes must be listed to affect suite price)**  
 Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).

**CONTAINER INFORMATION**

**Subcon / Forward Lab / Split**  
**Lab / Analysis:** *New Castle / Asbestos*  
**Organised By / Date:** *Enkore 9/10/13*  
**Relinquished By / Date:** *Enkore 9/10/13*  
**Connote / Courier:** *Tot 991013*  
**WO No:** *991013*  
**Attach By PO / Internal Code:** *991013*

**Additional Information**  
 Comments on likely contaminant levels, dilutions, or samples requiring specific GC analysis etc.

**Environmental Services**  
 12 Ashby St  
 Chatswood NSW 2067  
 Ph: (02) 9510 6200

**ENVIROLAB**  
 HOLD 98933  
 Date Received: 14/10/13  
 Time Received: 12:45  
 Received by: JH  
 Location: *Soil/Ambient*  
 Remarks: *Ice/icebags*  
 Broken/Spoken/Note

**FORWARD TO ENVIROLAB**

**Environmental Division Sydney**  
**Work Order ES1322146**

**Telephone: + 61-2-8784 8555**

**Water Container Codes:** P = Unpreserved Plastic; N = Nitro Preserved Plastic; ORC = Nitro Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide/Cd Preserved; AG = Ar V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sodium Bisulphate Preserved; AV = Airtight Unpreserved Vial SG = Sulphur Preserved Amber Glass; H = HCl Preserved V = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.



**Envirolab Services Pty Ltd**  
ABN 37 112 535 645  
12 Ashley St Chatswood NSW 2067  
ph 02 9910 6200 fax 02 9910 6201  
enquiries@envirolabservices.com.au  
www.envirolabservices.com.au

## **SAMPLE RECEIPT ADVICE**

### **Client:**

Environmental Resources Management Australia  
Locked Bag 24  
Broadway NSW 2007

ph: 02 8584 8888

Fax: 02 8584 8800

Attention: Jonathan Lekawksi

### **Sample log in details:**

Your reference:

**Mt Piper Soils**

Envirolab Reference:

**98933**

Date received:

14/10/2013

Date results expected to be reported:

**21/10/13**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	1 Soil
Turnaround time requested:	Standard
Temperature on receipt (°C)	8.8
Cooling Method:	Ice Pack
Sampling Date Provided:	YES

### **Comments:**

Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples.

### **Contact details:**

Please direct any queries to Aileen Hie or Jacinta Hurst

ph: 02 9910 6200 fax: 02 9910 6201

email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au



**CERTIFICATE OF ANALYSIS**

**98933**

**Client:**

**Environmental Resources Management Australia**

Locked Bag 24

Broadway

NSW 2007

**Attention:** Jonathan Lekawksi

**Sample log in details:**

Your Reference:

**Mt Piper Soils**

No. of samples:

1 Soil

Date samples received / completed instructions received

14/10/2013

/ 14/10/2013

**Analysis Details:**

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

***Please refer to the last page of this report for any comments relating to the results.***

**Report Details:**

Date results requested by: / Issue Date:

21/10/13

/

18/10/13

Date of Preliminary Report:

Not issued

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Accredited for compliance with ISO/IEC 17025.

**Tests not covered by NATA are denoted with \*.**

**Results Approved By:**



Jacinta Hurst  
Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference:	UNITS	98933-1
Your Reference	-----	T01_091013_
		TS
Date Sampled	-----	9/10/2013
Type of sample		Soil
Date extracted	-	15/10/2013
Date analysed	-	16/10/2013
TRHC <sub>6</sub> - C <sub>9</sub>	mg/kg	<25
TRHC <sub>6</sub> - C <sub>10</sub>	mg/kg	<25
vTPHC <sub>6</sub> - C <sub>10</sub> less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
naphthalene	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	112

Client Reference: Mt Piper Soils

svTRH (C10-C40) in Soil		
Our Reference:	UNITS	98933-1
Your Reference	-----	T01_091013_
		TS
Date Sampled	-----	9/10/2013
Type of sample		Soil
Date extracted	-	15/10/2013
Date analysed	-	16/10/2013
TRHC <sub>10</sub> - C <sub>14</sub>	mg/kg	<50
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	<100
TRHC <sub>29</sub> - C <sub>36</sub>	mg/kg	<100
TRH>C <sub>10</sub> -C <sub>16</sub>	mg/kg	<50
TRH>C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	mg/kg	<50
TRH>C <sub>16</sub> -C <sub>34</sub>	mg/kg	<100
TRH>C <sub>34</sub> -C <sub>40</sub>	mg/kg	<100
Surrogate o-Terphenyl	%	107

PAHs in Soil		
Our Reference:	UNITS	98933-1
Your Reference	-----	T01_091013_
		TS
Date Sampled	-----	9/10/2013
Type of sample		Soil
Date extracted	-	15/10/2013
Date analysed	-	16/10/2013
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	0.2
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Benzo(a)pyrene TEQNEPMB1	mg/kg	<0.5
Total +ve PAH's	mg/kg	0.19
Surrogate p-Terphenyl-d14	%	114

**Client Reference: Mt Piper Soils**

Total Phenolics in Soil		
Our Reference:	UNITS	98933-1
Your Reference	-----	T01_091013_ TS
Date Sampled	-----	9/10/2013
Type of sample		Soil
Date extracted	-	15/10/2013
Date analysed	-	15/10/2013
Total Phenolics (as Phenol)	mg/kg	<5

Client Reference: Mt Piper Soils

Acid Extractable metals in soil		
Our Reference:	UNITS	98933-1
Your Reference	-----	T01_091013_
		TS
Date Sampled	-----	9/10/2013
Type of sample		Soil
Date digested	-	15/10/2013
Date analysed	-	15/10/2013
Arsenic	mg/kg	<4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	2
Copper	mg/kg	4
Lead	mg/kg	8
Mercury	mg/kg	<0.1
Nickel	mg/kg	4
Zinc	mg/kg	9
Selenium	mg/kg	<2

**Client Reference: Mt Piper Soils**

Moisture		
Our Reference:	UNITS	98933-1
Your Reference	-----	T01_091013_
		TS
Date Sampled	-----	9/10/2013
Type of sample		Soil
Date prepared	-	15/10/2013
Date analysed	-	16/10/2013
Moisture	%	15



**Client Reference: Mt Piper Soils**

MethodID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note Naphthalene is determined from the VOC analysis.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Inorg-030	Total Phenolics - determined colorimetrically following disitillation, based upon APHA 22nd ED 5530 D.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105+/-5 deg C for a minimum of 12 hours.

**Client Reference: Mt Piper Soils**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
vTRH(C6-C10)/BTEXN in Soil						Base II Duplicate II %RPD		
Date extracted	-			15/10/2013	[NT]	[NT]	LCS-1	15/10/2013
Date analysed	-			16/10/2013	[NT]	[NT]	LCS-1	16/10/2013
TRHC <sub>6</sub> - C <sub>9</sub>	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-1	124%
TRHC <sub>6</sub> - C <sub>10</sub>	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-1	124%
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	LCS-1	119%
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	LCS-1	125%
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-1	116%
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	LCS-1	129%
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-1	128%
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	136	[NT]	[NT]	LCS-1	109%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
svTRH(C10-C40) in Soil						Base II Duplicate II %RPD		
Date extracted	-			15/10/2013	[NT]	[NT]	LCS-1	15/10/2013
Date analysed	-			16/10/2013	[NT]	[NT]	LCS-1	16/10/2013
TRHC <sub>10</sub> - C <sub>14</sub>	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-1	132%
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-1	124%
TRHC <sub>29</sub> - C <sub>36</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-1	94%
TRH>C <sub>10</sub> -C <sub>16</sub>	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-1	132%
TRH>C <sub>16</sub> -C <sub>34</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-1	124%
TRH>C <sub>34</sub> -C <sub>40</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-1	94%
Surrogate o-Terphenyl	%		Org-003	109	[NT]	[NT]	LCS-1	100%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Date extracted	-			15/10/2013	[NT]	[NT]	LCS-1	15/10/2013
Date analysed	-			16/10/2013	[NT]	[NT]	LCS-1	16/10/2013
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-1	104%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-1	104%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-1	101%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-1	100%

**Client Reference: Mt Piper Soils**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-1	103%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-1	98%
Benzo(b+k)fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	[NT]	[NT]	LCS-1	96%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	115	[NT]	[NT]	LCS-1	110%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Total Phenolics in Soil						Base II Duplicate II %RPD		
Date extracted	-			15/10/2013	[NT]	[NT]	LCS-1	15/10/2013
Date analysed	-			15/10/2013	[NT]	[NT]	LCS-1	15/10/2013
Total Phenolics (as Phenol)	mg/kg	5	Inorg-030	<5	[NT]	[NT]	LCS-1	108%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base II Duplicate II %RPD		
Date digested	-			15/10/2013	[NT]	[NT]	LCS-2	15/10/2013
Date analysed	-			15/10/2013	[NT]	[NT]	LCS-2	15/10/2013
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	LCS-2	97%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	[NT]	[NT]	LCS-2	104%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	100%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	98%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	98%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	LCS-2	87%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	101%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	100%

**Client Reference: Mt Piper Soils**

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base II Duplicate II %RPD		
Selenium	mg/kg	2	Metals-020 ICP-AES	<2	[NT]	[NT]	LCS-2	97%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank				
Moisture								
Date prepared	-			[NT]				
Date analysed	-			[NT]				
Moisture	%	0.1	Inorg-008	[NT]				

**Report Comments:**

Asbestos ID was analysed by Approved Identifier: Not applicable for this job  
 Asbestos ID was authorised by Approved Signatory: Not applicable for this job

INS: Insufficient sample for this test      PQL: Practical Quantitation Limit      NT: Not tested  
 NA: Test not required                      RPD: Relative Percent Difference      NA: Test not required  
 <: Less than                                  >: Greater than                              LCS: Laboratory Control Sample

**Quality Control Definitions**

**Blank:** This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

**Duplicate:** This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

**Matrix Spike :** A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

**LCS (Laboratory Control Sample) :** This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

**Surrogate Spike:** Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

**Laboratory Acceptance Criteria**

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.



# CHAIN OF CUSTODY

ALS Laboratory:  
please tick →

ALS Sydney  
115 Macquarie Street, Sydney NSW 2000  
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www.als.com.au

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ALS Brisbane  
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www.als.com.au

ALS Perth  
115 Macquarie Street, Perth WA 6000  
Ph: 08 9425 2222 Fax: 08 9425 2223  
www.als.com.au

CLIENT: ERM	TURNAROUND REQUIREMENTS : <input checked="" type="checkbox"/> Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle):	
OFFICE: Sydney	(Standard TAT may be longer for some tests e.g. Ultra Trace Organics) <input type="checkbox"/> Non Standard or urgent TAT (List due date):	Custody Seal intact	Yes No N/A
PROJECT: Project Symphony - MP	ALS QUOTE NO.: SY/278/13	Free / Ice / Insulated / Other Storage	Yes No N/A
ORDER NUMBER: 0207423		Random Sample Temperature / Location	C
PROJECT MANAGER: Jonathan Lekawski	CONTACT PH:	Other comment:	
SAMPLER: Thavone Shaw/ Gavin Powell	SAMPLER MOBILE:	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? ( YES / NO )	EDD FORMAT (or default): pdf/csv/excel	<i>Gavin Powell</i>	<i>Steven</i>
Email Reports to (will default to PM if no other addresses are listed): Symphony.DeltaWest@erm.com		DATE/TIME:	DATE/TIME:
Email Invoice to (will default to PM if no other addresses are listed): Symphony.DeltaWest@erm.com		<i>15/10/13 0730</i>	<i>16/10/13 8:15</i>

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS		CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)							Additional Information		
	MATRIX	DATE / TIME	TYPE & PRESERVATIVE codes below	TOTAL CONTAINERS	Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).									
LAB ID	SAMPLE ID				S-27 (8 metals: As, Cd, Cr, Cu, Ni, Pb, Zn, Hg, TRIBTEX, PAH/Phenols)	Additional Metal - Se	Asbestos	VOC Scan	PCB	Particle Sizing (hydrometer), TOC - EP004	pH, Exchangeable Cations plus ECEC	HOLD	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.	
8	MK-SB10-0-1	10/10/13	Soil	ST, B	2									
51	MK-SB10-0-85	10/10/13	"	ST	1							X		
9	MK-SB10-1-2	11/10/13	"	ST	1	X	X							
22	D-10MS-01-GP	10/10/13	"	ST	1							X		
10	D-111013-01-GP	11/10/13	"	ST	1	X	X							
1	D-111013-01-GP	11/10/13	"	ST	1	X	X						Emulated	
63	MC-MW05-0-3	"	"	ST, B	2							X		
12	MC-MW05-0-7	"	"	ST, B	2	X	X	X					Emulated 12 Asmsley Chatswood NSW 2067 Ph: (02) 9910 6200	
13	MC-MW05-1-0	"	"	ST	1			X	X				Job No: 99107	
14	MC-MW05-0-3	"	"	ST, B	2			X				X	Date Received: 16/10 Time Received: 11:05 Received by: [Signature]	
24	MC-MW05-0-7	"	"	ST	1							X	Temp: Cool Ambient Cooling: Ice/icepack	
15	MC-MW05-1-1	"	"	ST	1	X	X	X					Non/NL: [Signature]	

W = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic  
 V = Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;  
 Z = EDTA Preserved/Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.



# CHAIN OF CUSTODY

ALS Laboratory  
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ALS LABORATORY 111 Fennell Road, North Sydney NSW 1585 Australia  
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<b>CLIENT:</b> ERM	<b>TURNAROUND REQUIREMENTS :</b> (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	<input checked="" type="checkbox"/> Standard TAT (List due date): <input type="checkbox"/> Non Standard or urgent TAT (List due date):	<b>FOR LABORATORY USE ONLY (ICRM)</b>	
<b>OFFICE:</b> Sydney	<b>ALS QUOTE NO.:</b> SY/278/13	<b>COC SEQUENCE NUMBER (Circle)</b>	<b>COC:</b> ① 2 3 4 5 6 7	<b>OF:</b> 1 ② 3 4 5 6 7
<b>PROJECT:</b> Project Symphony - MP	<b>PROJECT MANAGER:</b> Jonathan Lekawski	<b>CONTACT PH:</b> 8584 8888	<b>RECEIVED BY:</b> Steven	<b>RECEIVED BY:</b>
<b>ORDER NUMBER:</b> 0207423	<b>SAMPLER:</b> Thavone Shaw / Gavin Powell	<b>SAMPLER MOBILE:</b> 0410163752	<b>DATE/TIME:</b> 15/10/15 0930	<b>DATE/TIME:</b>
<b>PROJECT MANAGER:</b> Jonathan Lekawski	<b>EOD FORMAT (or default):</b> pdf/cav/eadat	<b>RELINQUISHED BY:</b> Gavin Powell	<b>DATE/TIME:</b> 16/10/15 8:15	<b>DATE/TIME:</b>
<b>COC emailed to ALS? ( YES / NO )</b>	<b>Email Reports to (will default to PM if no other addresses are listed):</b> Symphony.DeltaWest@erm.com	<b>Email Invoice to (will default to PM if no other addresses are listed):</b> Symphony.DeltaWest@erm.com		

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).										Additional information
	MATRIX	DATE / TIME	TYPE & PRESERVATIVE codes below (refer to)	TOTAL CONTAINERS	S-27 (8 metals - As, Cd, Cr, Cu, Ni, Pb, Zn, Hg, TRIBTEX, PAH/Phenols)	Additional Metal - Se	Asbestos	VOC Scan	PCB	Particle Sizing (hydrometer), TOC - EP004	pH, Exchangeable Cations plus ECEC	HOLD				
①⑥	MD-MW01-0-1		ST, B	2									X	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.		
1	MD-MW01-0-5		ST, B	2			X									
2	MD-MW01-1-0		ST	1	X	X	X	X								
3	MK-SB15-0-1		ST, B	2	X	X	X									
①⑦	MK-SB15-0-5		ST	1									X			
①⑧	MK-SB16-0-1		ST	1									X			
4	MK-SB16-0-5		ST, B	2	X	X	X									
①⑨	MK-SB16-1-0		ST	1									X			
5	MK-SB09-0-1		ST, B	2	X	X	X									
6	MK-SB14-0-1		ST, B	2			X									
②①	MK-SB14-0-5		ST	1									X			
7	MK-SB14-1-0		ST	1	X	X										

Environmental Division  
Sydney  
Work Order  
**ES1322434**



Telephone : + 61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass  
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic;  
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag  
rved Plastic; F = Formaldehyde Preserved Glass;



**CERTIFICATE OF ANALYSIS**

**99107**

**Client:**

**Environmental Resources Management Australia**

Locked Bag 24

Broadway

NSW 2007

**Attention:** Jonathan Lekawski

**Sample log in details:**

Your Reference: **0207423, Project Symphony -MP**

No. of samples: 1 Soil

Date samples received / completed instructions received 16/10/2013 / 16/10/2013

*TRH\_S\_NEPM in soil # Percent recovery is not possible to report as the high concentration of analytes in the sample/s have caused interference.*

**Analysis Details:**

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

***Please refer to the last page of this report for any comments relating to the results.***

**Report Details:**

Date results requested by: / Issue Date: 23/10/13 / 21/10/13

Date of Preliminary Report: Not issued

NATA accreditation number 2901. This document shall not be reproduced except in full.

Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with \*.**

**Results Approved By:**



Jacinta Hurst  
Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference:	UNITS	99107-1
Your Reference	-----	T_111013_01 _GP
Date Sampled	-----	11/10/2013
Type of sample		Soil
Date extracted	-	17/10/2013
Date analysed	-	18/10/2013
TRHC <sub>6</sub> - C <sub>9</sub>	mg/kg	<25
TRHC <sub>6</sub> - C <sub>10</sub>	mg/kg	<25
vTPHC <sub>6</sub> - C <sub>10</sub> less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
naphthalene	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	92

svTRH(C10-C40) in Soil		
Our Reference:	UNITS	99107-1
Your Reference	-----	T_111013_01 _GP
Date Sampled	-----	11/10/2013
Type of sample		Soil
Date extracted	-	17/10/2013
Date analysed	-	18/10/2013
TRHC <sub>10</sub> - C <sub>14</sub>	mg/kg	<50
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	<100
TRHC <sub>29</sub> - C <sub>36</sub>	mg/kg	<100
TRH>C <sub>10</sub> -C <sub>16</sub>	mg/kg	<50
TRH>C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	mg/kg	<50
TRH>C <sub>16</sub> -C <sub>34</sub>	mg/kg	<100
TRH>C <sub>34</sub> -C <sub>40</sub>	mg/kg	<100
Surrogate o-Terphenyl	%	88

PAHs in Soil		
Our Reference:	UNITS	99107-1
Your Reference	-----	T_111013_01 _GP
Date Sampled	-----	11/10/2013
Type of sample		Soil
Date extracted	-	17/10/2013
Date analysed	-	18/10/2013
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Benzo(a)pyrene TEQNEPMB1	mg/kg	<0.5
Total +ve PAH's	mg/kg	NIL (+)VE
Surrogate p-Terphenyl-d14	%	107

Total Phenolics in Soil		
Our Reference:	UNITS	99107-1
Your Reference	-----	T_111013_01 _GP
Date Sampled	-----	11/10/2013
Type of sample		Soil
Date extracted	-	17/10/2013
Date analysed	-	17/10/2013
Total Phenolics (as Phenol)	mg/kg	<5

Acid Extractable metals in soil		
Our Reference:	UNITS	99107-1
Your Reference	-----	T_111013_01 _GP
Date Sampled	-----	11/10/2013
Type of sample		Soil
Date digested	-	18/10/2013
Date analysed	-	18/10/2013
Arsenic	mg/kg	4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	5
Copper	mg/kg	6
Lead	mg/kg	10
Mercury	mg/kg	<0.1
Nickel	mg/kg	7
Zinc	mg/kg	12
Selenium	mg/kg	<2

Moisture		
Our Reference:	UNITS	99107-1
Your Reference	-----	T_111013_01 _GP
Date Sampled	-----	11/10/2013
Type of sample		Soil
Date prepared	-	17/10/2013
Date analysed	-	18/10/2013
Moisture	%	18



MethodID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note Naphthalene is determined from the VOC analysis.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Inorg-030	Total Phenolics - determined colorimetrically following disitillation, based upon APHA 22nd ED 5530 D.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105+/-5 deg C for a minimum of 12 hours.

**Client Reference: 0207423, Project Symphony -MP**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
vTRH(C6-C10)/BTEXN in Soil						Base II Duplicate II %RPD		
Date extracted	-			17/10/2013	[NT]	[NT]	LCS-2	17/10/2013
Date analysed	-			18/10/2013	[NT]	[NT]	LCS-2	18/10/2013
TRHC <sub>6</sub> - C <sub>9</sub>	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-2	117%
TRHC <sub>6</sub> - C <sub>10</sub>	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-2	117%
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	LCS-2	106%
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	LCS-2	118%
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-2	116%
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	LCS-2	122%
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-2	119%
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	102	[NT]	[NT]	LCS-2	100%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
svTRH(C10-C40) in Soil						Base II Duplicate II %RPD		
Date extracted	-			17/10/2013	[NT]	[NT]	LCS-3	17/10/2013
Date analysed	-			18/10/2013	[NT]	[NT]	LCS-3	18/10/2013
TRHC <sub>10</sub> - C <sub>14</sub>	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-3	120%
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-3	113%
TRHC <sub>29</sub> - C <sub>36</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-3	109%
TRH>C <sub>10</sub> -C <sub>16</sub>	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-3	120%
TRH>C <sub>16</sub> -C <sub>34</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-3	113%
TRH>C <sub>34</sub> -C <sub>40</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-3	109%
Surrogate o-Terphenyl	%		Org-003	96	[NT]	[NT]	LCS-3	125%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Date extracted	-			17/10/2013	[NT]	[NT]	LCS-2	17/10/2013
Date analysed	-			18/10/2013	[NT]	[NT]	LCS-2	18/10/2013
Naphthalene	mg/kg	0.1	Org-012 subset	110	[NT]	[NT]	LCS-2	107%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	110	[NT]	[NT]	LCS-2	113%
Phenanthrene	mg/kg	0.1	Org-012 subset	110	[NT]	[NT]	LCS-2	107%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	100	[NT]	[NT]	LCS-2	104%

**Client Reference: 0207423, Project Symphony -MP**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Pyrene	mg/kg	0.1	Org-012 subset	110	[NT]	[NT]	LCS-2	106%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	95	[NT]	[NT]	LCS-2	95%
Benzo(b+k)fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	97	[NT]	[NT]	LCS-2	97%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	110	[NT]	[NT]	LCS-2	110%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Total Phenolics in Soil						Base II Duplicate II %RPD		
Date extracted	-			17/10/2013	[NT]	[NT]	LCS-1	17/10/2013
Date analysed	-			17/10/2013	[NT]	[NT]	LCS-1	17/10/2013
Total Phenolics (as Phenol)	mg/kg	5	Inorg-030	<5	[NT]	[NT]	LCS-1	89%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base II Duplicate II %RPD		
Date digested	-			18/10/2013	[NT]	[NT]	LCS-2	18/10/2013
Date analysed	-			18/10/2013	[NT]	[NT]	LCS-2	18/10/2013
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	LCS-2	99%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	[NT]	[NT]	LCS-2	10%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	106%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	117%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	96%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	LCS-2	87%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	104%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	100%

**Client Reference: 0207423, Project Symphony -MP**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base II Duplicate II %RPD		
Selenium	mg/kg	2	Metals-020 ICP-AES	<2	[NT]	[NT]	LCS-2	109%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank				
Moisture								
Date prepared	-			[NT]				
Date analysed	-			[NT]				
Moisture	%	0.1	Inorg-008	[NT]				

**Report Comments:**

Asbestos ID was analysed by Approved Identifier: Not applicable for this job  
 Asbestos ID was authorised by Approved Signatory: Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

**Quality Control Definitions**

**Blank:** This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

**Duplicate:** This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

**Matrix Spike :** A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

**LCS (Laboratory Control Sample) :** This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

**Surrogate Spike:** Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

**Laboratory Acceptance Criteria**

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.



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www.envirolabservices.com.au

## SAMPLE RECEIPT ADVICE

### **Client:**

Environmental Resources Management Australia  
Locked Bag 24  
Broadway NSW 2007

ph: 02 8584 8888  
Fax: 02 8584 8800

Attention: Jonathan Lekawski

### **Sample log in details:**

Your reference:	<b>0207423, Project Symphony -MP</b>
Envirolab Reference:	<b>99107</b>
Date received:	16/10/2013
Date results expected to be reported:	<b>23/10/13</b>

TRH\_S\_NEPM in soil # Percent recovery is not possible to report as the high concentration of analytes in the sample/s have caused interference.

Samples received in appropriate condition for analysis:	YES
No. of samples provided	1 Soil
Turnaround time requested:	Standard
Temperature on receipt (°C)	3.3
Cooling Method:	Ice
Sampling Date Provided:	YES

### **Comments:**

Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples.

### **Contact details:**

Please direct any queries to Aileen Hie or Jacinta Hurst  
ph: 02 9910 6200 fax: 02 9910 6201  
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au





**CERTIFICATE OF ANALYSIS**

**99393**

**Client:**

**Environmental Resources Management Australia**

Locked Bag 24

Broadway

NSW 2007

**Attention:** Chuck Terhune, Jonathon Lekawski

**Sample log in details:**

Your Reference:

**0207423, Symphony**

No. of samples:

1 Soil

Date samples received / completed instructions received

22/10/13

/ 22/10/13

**Analysis Details:**

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

***Please refer to the last page of this report for any comments relating to the results.***

**Report Details:**

Date results requested by: / Issue Date:

29/10/13

/ 28/10/13

Date of Preliminary Report:

Not issued

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Accredited for compliance with ISO/IEC 17025.

**Tests not covered by NATA are denoted with \*.**

**Results Approved By:**



Jacinta Hurst  
Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference:	UNITS	99393-1
Your Reference	-----	T_141011_01 _GP
Date Sampled	-----	14/10/2013
Type of sample		Soil
Date extracted	-	24/10/2013
Date analysed	-	24/10/2013
TRHC <sub>6</sub> - C <sub>9</sub>	mg/kg	<25
TRHC <sub>6</sub> - C <sub>10</sub>	mg/kg	<25
vTPHC <sub>6</sub> - C <sub>10</sub> less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
naphthalene	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	92

svTRH (C10-C40) in Soil		
Our Reference:	UNITS	99393-1
Your Reference	-----	T_141011_01 _GP
Date Sampled	-----	14/10/2013
Type of sample		Soil
Date extracted	-	24/10/2013
Date analysed	-	25/10/2013
TRHC <sub>10</sub> - C <sub>14</sub>	mg/kg	<50
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	<100
TRHC <sub>29</sub> - C <sub>36</sub>	mg/kg	<100
TRH>C <sub>10</sub> -C <sub>16</sub>	mg/kg	<50
TRH>C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	mg/kg	<50
TRH>C <sub>16</sub> -C <sub>34</sub>	mg/kg	<100
TRH>C <sub>34</sub> -C <sub>40</sub>	mg/kg	<100
Surrogate o-Terphenyl	%	103

PAHs in Soil		
Our Reference:	UNITS	99393-1
Your Reference	-----	T_141011_01 _GP
Date Sampled	-----	14/10/2013
Type of sample		Soil
Date extracted	-	24/10/2013
Date analysed	-	25/10/2013
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Benzo(a)pyrene TEQNEPMB1	mg/kg	<0.5
Total +ve PAH's	mg/kg	NIL (+)VE
Surrogate p-Terphenyl-d14	%	91

Total Phenolics in Soil		
Our Reference:	UNITS	99393-1
Your Reference	-----	T_141011_01 _GP
Date Sampled	-----	14/10/2013
Type of sample		Soil
Date extracted	-	23/10/2013
Date analysed	-	23/10/2013
Total Phenolics (as Phenol)	mg/kg	<5

Acid Extractable metals in soil		
Our Reference:	UNITS	99393-1
Your Reference	-----	T_141011_01 _GP
Date Sampled	-----	14/10/2013
Type of sample		Soil
Date digested	-	23/10/2013
Date analysed	-	23/10/2013
Arsenic	mg/kg	8
Cadmium	mg/kg	<0.4
Chromium	mg/kg	11
Copper	mg/kg	9
Lead	mg/kg	21
Mercury	mg/kg	<0.1
Nickel	mg/kg	12
Zinc	mg/kg	32
Selenium	mg/kg	<2

Moisture		
Our Reference:	UNITS	99393-1
Your Reference	-----	T_141011_01 _GP
Date Sampled	-----	14/10/2013
Type of sample		Soil
Date prepared	-	23/10/2013
Date analysed	-	23/10/2013
Moisture	%	13



MethodID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note Naphthalene is determined from the VOC analysis.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Inorg-030	Total Phenolics - determined colorimetrically following distillation, based upon APHA 22nd ED 5530 D.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105+/-5 deg C for a minimum of 12 hours.

**Client Reference: 0207423, Symphony**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
vTRH(C6-C10)/BTEXN in Soil						Base II Duplicate II %RPD		
Date extracted	-			24/10/2013	[NT]	[NT]	LCS-3	24/10/2013
Date analysed	-			24/10/2013	[NT]	[NT]	LCS-3	24/10/2013
TRHC <sub>6</sub> - C <sub>9</sub>	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-3	109%
TRHC <sub>6</sub> - C <sub>10</sub>	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-3	109%
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	LCS-3	100%
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	LCS-3	111%
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-3	111%
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	LCS-3	111%
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-3	110%
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	102	[NT]	[NT]	LCS-3	106%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
svTRH(C10-C40) in Soil						Base II Duplicate II %RPD		
Date extracted	-			24/10/2013	[NT]	[NT]	LCS-3	24/10/2013
Date analysed	-			25/10/2013	[NT]	[NT]	LCS-3	25/10/2013
TRHC <sub>10</sub> - C <sub>14</sub>	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-3	126%
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-3	115%
TRHC <sub>29</sub> - C <sub>36</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-3	91%
TRH>C <sub>10</sub> -C <sub>16</sub>	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-3	126%
TRH>C <sub>16</sub> -C <sub>34</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-3	115%
TRH>C <sub>34</sub> -C <sub>40</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-3	91%
Surrogate o-Terphenyl	%		Org-003	102	[NT]	[NT]	LCS-3	137%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Date extracted	-			24/10/2013	[NT]	[NT]	LCS-3	24/10/2013
Date analysed	-			25/10/2013	[NT]	[NT]	LCS-3	25/10/2013
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-3	112%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-3	111%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-3	93%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-3	98%

**Client Reference: 0207423, Symphony**

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-3	128%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-3	98%
Benzo(b+k)fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	[NT]	[NT]	LCS-3	92%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	109	[NT]	[NT]	LCS-3	102%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Total Phenolics in Soil						Base II Duplicate II %RPD		
Date extracted	-			23/10/2013	[NT]	[NT]	LCS-1	23/10/2013
Date analysed	-			23/10/2013	[NT]	[NT]	LCS-1	23/10/2013
Total Phenolics (as Phenol)	mg/kg	5	Inorg-030	<5	[NT]	[NT]	LCS-1	77%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base II Duplicate II %RPD		
Date digested	-			23/10/2013	[NT]	[NT]	LCS-1	23/10/2013
Date analysed	-			23/10/2013	[NT]	[NT]	LCS-1	23/10/2013
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	LCS-1	101%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	[NT]	[NT]	LCS-1	106%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	106%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	104%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	103%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	LCS-1	88%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	105%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	104%

**Client Reference: 0207423, Symphony**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base II Duplicate II %RPD		
Selenium	mg/kg	2	Metals-020 ICP-AES	<2	[NT]	[NT]	LCS-1	100%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank				
Moisture								
Date prepared	-			[NT]				
Date analysed	-			[NT]				
Moisture	%	0.1	Inorg-008	[NT]				
QUALITYCONTROL	UNITS	Dup. Sm#		Duplicate		Spike Sm#	Spike % Recovery	
Acid Extractable metals in soil				Base + Duplicate + %RPD				
Date digested	-	[NT]		[NT]		99393-1	23/10/2013	
Date analysed	-	[NT]		[NT]		99393-1	23/10/2013	
Arsenic	mg/kg	[NT]		[NT]		99393-1	80%	
Cadmium	mg/kg	[NT]		[NT]		99393-1	86%	
Chromium	mg/kg	[NT]		[NT]		99393-1	82%	
Copper	mg/kg	[NT]		[NT]		99393-1	89%	
Lead	mg/kg	[NT]		[NT]		99393-1	81%	
Mercury	mg/kg	[NT]		[NT]		99393-1	83%	
Nickel	mg/kg	[NT]		[NT]		99393-1	83%	
Zinc	mg/kg	[NT]		[NT]		99393-1	77%	
Selenium	mg/kg	[NT]		[NT]		99393-1	78%	

**Report Comments:**

Asbestos ID was analysed by Approved Identifier: Not applicable for this job  
 Asbestos ID was authorised by Approved Signatory: Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

**Quality Control Definitions**

**Blank:** This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

**Duplicate:** This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

**Matrix Spike :** A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

**LCS (Laboratory Control Sample) :** This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

**Surrogate Spike:** Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

**Laboratory Acceptance Criteria**

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.



ERM

- Sydney
- Melbourne
- Brisbane
- Perth
- Hunter Valley
- North Coast
- Other

Grnd Floor, 33 Saunders Street, Pyrmont, NSW, 2009. (ph) 02 8584 8888 (fax) 02 8584 8800  
 Level 3, Yarra Tower, WTC, 10-36 Saddleley Street, Docklands, VIC, 3005. (ph) 03 9696 8011 (fax) 03 9696 8022  
 Level 1, 60 Leichhardt Street, Spring Hill, QLD, 4004. (ph) 07 3899 8393 (fax) 07 3899 8381  
 Level 6, Grain Pool Bld, 172 St Georges Tce, WA, 6850. (ph) 08 9321 5200 (fax) 08 9321 5252  
 53 Bonville Avenue, Thornton, NSW, 2322. (ph) 02 4964 2150 (fax) 02 4964 2152  
 Suite 3/146 Gordon Street, Port Macquarie, NSW, 2444. (ph) 02 6584 7155 (fax) 02 6584 7160

Project No: **0607473**  
 Project Name: **Symphony**  
 Project Location: **Mt. Piper**  
 Project Manager: **Jonathan Lekowski**  
 Sampler: **Carvin Powell**

COG Number  
**A 11722**  
 Laboratory  
**ALS**

General Analysis Requirements

1. Turn Around Time (please tick:  1 Day  2 Days  3 Days  Normal TAT)
2. Do you wish any sediment layers in water to be excluded from extractions?
3. Additional QA/QC reported where sample batches are < 10 samples?
4. % of extraneous material removed from samples to be reported as per NEPM 5.1.1?

Laboratory Number	Sample ID	Sample Depth	Sample Date	Sample Time	Matrix			Preservation			Containers (numbers/type)	BTEX	TPH (C6-C9 P & T) + TPH (C10-C35)	Specialist TPH	VOC Scan (USEPA 8260 List)	SVOC Scan (USEPA 8270 List)	OC OP Preservatives	PAH	Phenols	PCB	Metals (dissolved / total)	Asbestos	VOC SCAN	HOLD
					Sg	Water	Other	Ice	Acid	Filtr														
1	MK_S852_0-1		14/10		X		X				2										X	X		
2	MK_S850_0-1										2										X	X	X	
32	MK_S858_0-5										1										X	X	X	
3	MK_S816_1-5										1										X	X	X	
33	MK_S816_5-0										1													X
34	MK_S816_8-0										1													X
4	D_141011_01_GP										1										X			
5	D_141011_01_GP		14/10			X					1										X			
5	MK_S859_0-2		15/10			X					2										X	X		
35	MK_S840_0-1					X					2													X
6	MK_S840_0-7					X					2										X	X		
36	MK_S839_0-2					X					2													X
37	MK_S839_0-5					X					2													X
7	MK_S839_1-0					X					2										X	X		
8	MK_S832_0-1					X					2										X	X		
9	MK_S831_0-2					X					2										X	X		
10	MK_S836_0-1					X					2										X	X		
11	MK_S837_0-3					X					2										X			
38	MK_S837_0-5		15/10			X		X			1													X

Other Comments on sample  
 (eg: high voc, highly contaminated, special detection limits etc etc)

Environmental Division  
 Sydney  
 Work Order  
**ES1322662**



Telephone: +61-2-8784 8555

To EnviroLab please

EnviroLab Services  
 12 Ashby St  
 Chatswood NSW 2087  
 Ph: (02) 9910 6200  
 Job No: **99393**  
 Date Received: **22/10/13**  
 Time Received: **13:55**  
 Received by: **AW**  
 Temp: **COO/Ambient**  
 Cooling: **Ice/Repack**  
 Security: **Intact/Broken/None**

Comments: quote # SY/278/13, email to [symphony.deltawest@erm.com](mailto:symphony.deltawest@erm.com)

\*Metals (circle)  
 (As) (Cd) (Cr) (Cu) (Fe) (Ni) (Pb) (Zn) (Se)

Relinquished by: **Carvin Powell** Signed: *[Signature]* Date/Time: **12/10/13** Received by: **FMSi** Date/Time: **18/10/13 10:30am**

Relinquished by: Signed: Date/Time: Received by: **A. Near B** Date/Time: **22/10/13 13:55**



**Envirolab Services Pty Ltd**  
ABN 37 112 535 645  
12 Ashley St Chatswood NSW 2067  
ph 02 9910 6200 fax 02 9910 6201  
enquiries@envirolabservices.com.au  
www.envirolabservices.com.au

## **SAMPLE RECEIPT ADVICE**

### **Client:**

Environmental Resources Management Australia  
Locked Bag 24  
Broadway NSW 2007

ph: 02 8584 8888

Fax: 02 8584 8800

Attention: Chuck Terhune, Jonathon Lekawski

### **Sample log in details:**

Your reference:

**0207420, Symphony**

Envirolab Reference:

**99393**

Date received:

22/10/133

Date results expected to be reported:

**29/10/13**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	1 Soil
Turnaround time requested:	Standard
Temperature on receipt (°C)	11.5
Cooling Method:	Ice Pack
Sampling Date Provided:	YES

### **Comments:**

Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples.

### **Contact details:**

Please direct any queries to Aileen Hie or Jacinta Hurst

ph: 02 9910 6200 fax: 02 9910 6201

email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au







# CHAIN OF CUSTODY

ALS Laboratory  
please tick →

LABORATORY ADDRESS:  
1500 E. Galena Blvd  
Denver, CO 80202

LABORATORY CONTACT:  
Ph: 303.440.2600  
Fax: 303.440.2601

LABORATORY WEBSITE:  
www.als-lab.com

**CLIENT:** ERM  
**OFFICE:** GROUND FLOOR, 33 SAUNDERS ST, PYRMONT NSW 2008  
**PROJECT:** Mt Piper Soils  
**ORDER NUMBER:** 0207423  
**PROJECT MANAGER:** Jonathan Lakawki  
**SAMPLER:** Thavone Shaw  
**CONTACT PH:**  
**SAMPLER MOBILE:**  
**EDD FORMAT (or default):**  
 Email Reports to (will default to PM if no other addresses are listed): [Symphony.Delta.Vest@erm.com](mailto:Symphony.Delta.Vest@erm.com)  
 Email Invoices to (will default to PM if no other addresses are listed): [Symphony.Delta.Vest@erm.com](mailto:Symphony.Delta.Vest@erm.com)

**TURNAROUND REQUIREMENTS:**  
 Standard TAT (List due date):  
 Non Standard or urgent TAT (List due date):  
**ALS QUOTE NO.:** SY278/13

**FOR LABORATORY USE ONLY (Circle)**  
 Custody Seal Intact? Yes No N/A  
 Free lid / frozen (ice blocks present upon receipt)? Yes No N/A  
 Random Sample?  **Apparatus on Receipt:**  
 Other comment:

**RECEIVED BY:** David  
**DATE/TIME:** 11/10 0830  
**RELINQUISHED BY:**  
**DATE/TIME:**

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (to codes below)	CONTAINER INFORMATION	ANALYSIS REQUIRED INCLUDING SUITES (NB. Suite Codes must be listed to attract suite price) (unfilled bottles required) or Dissolved (field filled bottle required)	Asbestos	VOC Scan	WO No:	Attach By PO / Internal Sheet:	Connote / Courier:	Requisitioned By / Date:	Lab / Analysis:	Subcon / Forward Lab / Split WO	Additional Information
1	ML_SB07_0.2	8-Oct-13	Soil	Ice	(refer to codes below)	Additional Metal - S-27 (6 metals)-As Cd, Cr, Cu, Ni, Pb, Zn, Hg, TRH/BTEX, PAH/Phenols)	X	X							
2	MB_MW04_0.2	8-Oct-13	Soil	Ice			X	X							HOLD
3	MB_MW04_0.5	9-Oct-13	Soil	Ice			X	X							HOLD
4	MB_MW05_0.2	9-Oct-13	Soil	Ice			X	X							HOLD
5	MB_MW05_0.5	9-Oct-13	Soil	Ice			X	X							HOLD
6	MB_MW05_1.0	9-Oct-13	Soil	Ice			X	X							HOLD
7	MB_MW08_0.2	9-Oct-13	Soil	Ice			X	X							HOLD
8	MB_MW08_0.5	9-Oct-13	Soil	Ice			X	X							HOLD
9	MB_MW01_0.2	9-Oct-13	Soil	Ice			X	X							HOLD
10	MB_MW03_0.2	9-Oct-13	Soil	Ice			X	X							HOLD
11	MB_MW03_0.8	9-Oct-13	Soil	Ice			X	X							HOLD
12	MB_MW03_1.0	9-Oct-13	Soil	Ice			X	X							HOLD
13	ML_SB04_0.2	9-Oct-13	Soil	Ice			X	X							HOLD
14	MB_MW02_0.2	9-Oct-13	Soil	Ice			X	X							HOLD
15	D01_091013_TB	9-Oct-13	Soil	Ice			X	X							HOLD
16	D02_091013_TB	9-Oct-13	Soil	Ice			X	X							HOLD
17	T01_091013_TB	9-Oct-13	Soil	Ice			X	X							HOLD
<b>TOTAL:</b>						22									

**Environmental Division Sydney**  
**Work Order ES1322146**

**FORWARD TO ENV/ROLAB**

Telephone : + 61-2-8784 8555

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

<b>Work Order</b>	: <b>ES1322146</b>		
<b>Amendment</b>	: <b>1</b>		
<b>Client</b>	: <b>ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: MR JONATHAN LEKAWSKI	<b>Contact</b>	: Barbara Hanna
<b>Address</b>	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: jonathan.lekawski@erm.com	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: MT PIPER SOILS	<b>Page</b>	: 1 of 3
<b>Order number</b>	: 0207423	<b>Quote number</b>	: ES2013ENVRES0370 (SY/278/13 V3)
<b>C-O-C number</b>	: ----	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b>	: ----		
<b>Sampler</b>	: TS		

#### Dates

Date Samples Received	: 11-OCT-2013	Issue Date	: 25-OCT-2013 11:08
Client Requested Due Date	: 18-OCT-2013	Scheduled Reporting Date	: <b>18-OCT-2013</b>

#### Delivery Details

Mode of Delivery	: Carrier	Temperature	: 11.9'C - Ice bricks present
No. of coolers/boxes	: 4 HARD	No. of samples received	: 16
Security Seal	: Intact.	No. of samples analysed	: 11

#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Samples received in appropriately pretreated and preserved containers.
- Sample T01\_091013\_TS to be forwarded to Envirolab.
- **Samples received in appropriately pretreated and preserved containers.**
- **Asbestos analysis will be conducted by ALS Newcastle.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA200 Asbestos Identification in Soils	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - S-27 TRH/TEXNI/PAH/Phenols/6Metals
ES1322146-001	08-OCT-2013 15:00	MI_SB07_0.2		✓	✓	✓
ES1322146-002	08-OCT-2013 15:00	MB_MW04_0.5		✓	✓	✓
ES1322146-003	09-OCT-2013 15:00	MB_MW05_0.5		✓	✓	✓
ES1322146-004	09-OCT-2013 15:00	ML_MW08_0.5		✓	✓	✓
ES1322146-005	09-OCT-2013 15:00	MB_MW01_0.2			✓	✓
ES1322146-006	09-OCT-2013 15:00	MB_MW03_0.2		✓	✓	✓
ES1322146-007	09-OCT-2013 15:00	MB_MW03_1.0			✓	✓
ES1322146-008	09-OCT-2013 15:00	MI_SB04_0.2			✓	✓
ES1322146-009	09-OCT-2013 15:00	MB_MW02_0.2			✓	✓
ES1322146-010	09-OCT-2013 15:00	D01_091013_TS			✓	✓
ES1322146-011	09-OCT-2013 15:00	D02_091013_TS			✓	✓
ES1322146-012	08-OCT-2013 15:00	MB_MW04_0.2	✓			
ES1322146-013	09-OCT-2013 15:00	MB_MW05_0.2	✓			
ES1322146-014	09-OCT-2013 15:00	MB_MW05_1.0	✓			
ES1322146-015	09-OCT-2013 15:00	ML_MW08_0.2	✓			
ES1322146-016	09-OCT-2013 15:00	MB_MW03_0.6	✓			

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



## Requested Deliverables

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA ) Email jonathan.lekawski@erm.com
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI ) Email jonathan.lekawski@erm.com
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC ) Email jonathan.lekawski@erm.com
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN ) Email jonathan.lekawski@erm.com
- Chain of Custody (CoC) ( COC ) Email jonathan.lekawski@erm.com
- EDI Format - ENMRG ( ENMRG ) Email jonathan.lekawski@erm.com
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM ) Email jonathan.lekawski@erm.com
- EDI Format - ESDAT ( ESDAT ) Email jonathan.lekawski@erm.com
- EDI Format - XTab ( XTAB ) Email jonathan.lekawski@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA Email symphony.deltawest@erm.com
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) Email symphony.deltawest@erm.com
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA Email symphony.deltawest@erm.com
- A4 - AU Sample Receipt Notification - Environmental HT Email symphony.deltawest@erm.com
- A4 - AU Tax Invoice ( INV ) Email symphony.deltawest@erm.com
- Chain of Custody (CoC) Email symphony.deltawest@erm.com
- EDI Format - ENMRG Email symphony.deltawest@erm.com
- EDI Format - EQUIS V5 ERM Email symphony.deltawest@erm.com
- EDI Format - ESDAT Email symphony.deltawest@erm.com
- EDI Format - XTab Email symphony.deltawest@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV ) Email au.accounts@erm.com

## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>ES1322146</b> <b>Amendment</b> : <b>1</b> <b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : <b>MR JONATHAN LEKAWSKI</b> <b>Address</b> : <b>GROUND FLOOR</b> <b>33 SAUNDERS STREET, PYRMONT NSW 2009</b> <b>LOCKED BAG 24</b> <b>BROADWAY NSW, AUSTRALIA 2007</b>  <b>E-mail</b> : <b>jonathan.lekawski@erm.com</b> <b>Telephone</b> : <b>+61 02 8584 8888</b> <b>Facsimile</b> : <b>+61 02 8584 8800</b> <b>Project</b> : <b>MT PIPER SOILS</b> <b>Order number</b> : <b>0207423</b> <b>C-O-C number</b> : <b>----</b> <b>Sampler</b> : <b>TS</b> <b>Site</b> : <b>----</b>  <b>Quote number</b> : <b>SY/278/13 V3</b>	<b>Page</b> : 1 of 12  <b>Laboratory</b> : Environmental Division Sydney <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164  <b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555 <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement  <b>Date Samples Received</b> : 11-OCT-2013 <b>Issue Date</b> : 25-OCT-2013  <b>No. of samples received</b> : 16 <b>No. of samples analysed</b> : 11
--	--

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Christopher Owler	Team Leader - Asbestos	Newcastle - Asbestos
Pabi Subba	Senior Organic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Sanjeshni Jyoti Mala	Senior Chemist Volatile	Sydney Organics



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EA200 Legend**
- **EA200 'Am' Amosite (brown asbestos)**
- **EA200 'Ch' Chrysotile (white asbestos)**
- **EA200 'Cr' Crocidolite (blue asbestos)**
- **EA200 'Trace' - Asbestos fibres detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres**
- **EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.**
- **EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.**
- **EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.**





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MI_SB07_0.2	MB_MW04_0.5	MB_MW05_0.5	ML_MW08_0.5	MB_MW01_0.2
				08-OCT-2013 15:00	08-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322146-001	ES1322146-002	ES1322146-003	ES1322146-004	ES1322146-005
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	16.3	17.0	15.5	14.0	20.0
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	----
Asbestos Type	1332-21-4	0.1	--	-	-	-	-	----
Sample weight (dry)	----	0.01	g	266	299	590	336	----
APPROVED IDENTIFIER:	----	-	--	C.OWLER	C.OWLER	C.OWLER	C.OWLER	----
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	21	17	10	21	10
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	13	15	10	13	9
Copper	7440-50-8	5	mg/kg	19	25	15	36	16
Lead	7439-92-1	5	mg/kg	18	30	18	28	28
Nickel	7440-02-0	2	mg/kg	15	71	28	75	38
Zinc	7440-66-6	5	mg/kg	31	101	42	106	59
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MI_SB07_0.2	MB_MW04_0.5	MB_MW05_0.5	ML_MW08_0.5	MB_MW01_0.2
				08-OCT-2013 15:00	08-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322146-001	ES1322146-002	ES1322146-003	ES1322146-004	ES1322146-005
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MI_SB07_0.2	MB_MW04_0.5	MB_MW05_0.5	ML_MW08_0.5	MB_MW01_0.2
				08-OCT-2013 15:00	08-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322146-001	ES1322146-002	ES1322146-003	ES1322146-004	ES1322146-005
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	103	105	97.0	110	106
2-Chlorophenol-D4	93951-73-6	0.1	%	97.9	102	91.9	107	110
2,4,6-Tribromophenol	118-79-6	0.1	%	109	103	105	87.0	95.1
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	101	102	101	101	101
Anthracene-d10	1719-06-8	0.1	%	93.4	97.5	94.8	92.4	89.1
4-Terphenyl-d14	1718-51-0	0.1	%	92.9	101	98.0	96.6	91.2
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	102	96.8	102	93.5	107
Toluene-D8	2037-26-5	0.1	%	104	94.6	100	99.4	102
4-Bromofluorobenzene	460-00-4	0.1	%	126	110	121	109	115



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MB_MW03_0.2	MB_MW03_1.0	MI_SB04_0.2	MB_MW02_0.2	D01_091013_TS
				09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322146-006	ES1322146-007	ES1322146-008	ES1322146-009	ES1322146-010
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	20.0	10.6	9.3	5.2	16.1
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	----	----	----	----
Asbestos Type	1332-21-4	0.1	--	-	----	----	----	----
Sample weight (dry)	----	0.01	g	298	----	----	----	----
APPROVED IDENTIFIER:	----	-	--	C.OWLER	----	----	----	----
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	<5	6	16	5	15
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	4	4	2	4	18
Copper	7440-50-8	5	mg/kg	22	7	12	10	31
Lead	7439-92-1	5	mg/kg	22	11	32	12	36
Nickel	7440-02-0	2	mg/kg	23	10	5	22	80
Zinc	7440-66-6	5	mg/kg	19	20	13	40	108
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MB_MW03_0.2	MB_MW03_1.0	MI_SB04_0.2	MB_MW02_0.2	D01_091013_TS
				09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322146-006	ES1322146-007	ES1322146-008	ES1322146-009	ES1322146-010
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<b>2.6</b>	<0.5	<b>0.8</b>
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<b>1.8</b>	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<b>1.3</b>	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<b>0.5</b>	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<b>0.6</b>	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<b>6.8</b>	<0.5	<b>0.8</b>
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<b>50</b>	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<b>380</b>	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<b>100</b>	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<b>530</b>	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<b>100</b>	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<b>410</b>	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<b>510</b>	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<b>100</b>	<50	<50



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MB_MW03_0.2	MB_MW03_1.0	MI_SB04_0.2	MB_MW02_0.2	D01_091013_TS
				09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322146-006	ES1322146-007	ES1322146-008	ES1322146-009	ES1322146-010
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	106	113	108	108	106
2-Chlorophenol-D4	93951-73-6	0.1	%	110	108	104	106	112
2,4,6-Tribromophenol	118-79-6	0.1	%	102	104	103	101	93.1
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	98.8	102	101	103	103
Anthracene-d10	1719-06-8	0.1	%	86.5	95.7	81.4	96.3	89.4
4-Terphenyl-d14	1718-51-0	0.1	%	91.7	100	93.6	98.7	93.9
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	95.6	106	106	114	93.7
Toluene-D8	2037-26-5	0.1	%	99.4	101	97.7	115	93.2
4-Bromofluorobenzene	460-00-4	0.1	%	106	119	110	129	102



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

D02\_091013\_TS

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Client sampling date / time

09-OCT-2013 15:00

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Compound	CAS Number	LOR	Unit	ES1322146-011	---	---	---	---
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### EA055: Moisture Content

Moisture Content (dried @ 103°C)	---	1.0	%	14.4	---	---	---	---
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### EG005T: Total Metals by ICP-AES

Selenium	7782-49-2	5	mg/kg	<5	---	---	---	---
Arsenic	7440-38-2	5	mg/kg	<5	---	---	---	---
Cadmium	7440-43-9	1	mg/kg	<1	---	---	---	---
Chromium	7440-47-3	2	mg/kg	<2	---	---	---	---
Copper	7440-50-8	5	mg/kg	<5	---	---	---	---
Lead	7439-92-1	5	mg/kg	8	---	---	---	---
Nickel	7440-02-0	2	mg/kg	3	---	---	---	---
Zinc	7440-66-6	5	mg/kg	8	---	---	---	---

### EG035T: Total Recoverable Mercury by FIMS

Mercury	7439-97-6	0.1	mg/kg	<0.1	---	---	---	---
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### EP075(SIM)A: Phenolic Compounds

Phenol	108-95-2	0.5	mg/kg	<0.5	---	---	---	---
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	---	---	---	---
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	---	---	---	---
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	---	---	---	---
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	---	---	---	---
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	---	---	---	---
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	---	---	---	---
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	---	---	---	---
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	---	---	---	---
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	---	---	---	---
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	---	---	---	---
Pentachlorophenol	87-86-5	2	mg/kg	<2	---	---	---	---

### EP075(SIM)B: Polynuclear Aromatic Hydrocarbons

Naphthalene	91-20-3	0.5	mg/kg	<0.5	---	---	---	---
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	---	---	---	---
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	---	---	---	---
Fluorene	86-73-7	0.5	mg/kg	<0.5	---	---	---	---
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	---	---	---	---
Anthracene	120-12-7	0.5	mg/kg	<0.5	---	---	---	---
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	---	---	---	---





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

D02\_091013\_TS

Client sampling date / time

09-OCT-2013 15:00

Compound	CAS Number	LOR	Unit	ES1322146-011				
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### EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued

Pyrene	129-00-0	0.5	mg/kg	<0.5	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	----	----	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	----	----	----
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	----	----	----	----

### EP080/071: Total Petroleum Hydrocarbons

C6 - C9 Fraction	----	10	mg/kg	<10	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----

### EP080/071: Total Recoverable Hydrocarbons - NEPM 2013

C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	----	----	----	----
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	----	----	----	----

### EP080: BTEXN

Benzene	71-43-2	0.2	mg/kg	<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	----	----	----



## Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)

Client sample ID

**D02\_091013\_TS**

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Client sampling date / time

09-OCT-2013 15:00

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Compound	CAS Number	LOR	Unit	ES1322146-011	----	----	----	----
<b>EP080: BTEXN - Continued</b>								
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	----	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg	<1	----	----	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	<b>102</b>	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	<b>97.9</b>	----	----	----	----
2,4,6-Tribromophenol	118-79-6	0.1	%	<b>106</b>	----	----	----	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	<b>104</b>	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%	<b>100</b>	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	<b>103</b>	----	----	----	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	<b>108</b>	----	----	----	----
Toluene-D8	2037-26-5	0.1	%	<b>111</b>	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	<b>132</b>	----	----	----	----

## Analytical Results

### Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>		
EA200: Description	MI_SB07_0.2 - 08-OCT-2013 15:00	Pale brown clay soil with some grey rocks plus a trace of vegetation
EA200: Description	MB_MW04_0.5 - 08-OCT-2013 15:00	Pale brown clay soil with some grey and red rocks plus a trace of vegetation
EA200: Description	MB_MW05_0.5 - 09-OCT-2013 15:00	Pale brown clay soil with some grey rocks plus a trace of vegetation
EA200: Description	ML_MW08_0.5 - 09-OCT-2013 15:00	Pale brown clay soil with some grey rocks plus some slag grains and a trace of vegetation
EA200: Description	MB_MW03_0.2 - 09-OCT-2013 15:00	Pale brown clay soil with some grey rocks plus a trace of vegetation



## Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

## QUALITY CONTROL REPORT

<b>Work Order</b>	: <b>ES1322146</b>	Page	: 1 of 11
<b>Amendment</b>	: <b>1</b>		
<b>Client</b>	: <b>ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: MR JONATHAN LEKAWSKI	<b>Contact</b>	: Barbara Hanna
<b>Address</b>	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: jonathan.lekawski@erm.com	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: MT PIPER SOILS	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b>	: ----		
<b>C-O-C number</b>	: ----	<b>Date Samples Received</b>	: 11-OCT-2013
<b>Sampler</b>	: TS	<b>Issue Date</b>	: 25-OCT-2013
<b>Order number</b>	: 0207423		
<b>Quote number</b>	: SY/278/13 V3	<b>No. of samples received</b>	: 16
		<b>No. of samples analysed</b>	: 11

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Christopher Owlser	Team Leader - Asbestos	Newcastle - Asbestos
Pabi Subba	Senior Organic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Sanjeshni Jyoti Mala	Senior Chemist Volatile	Sydney Organics



## **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :  
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
RPD = Relative Percentage Difference  
# = Indicates failed QC



## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EA055: Moisture Content (QC Lot: 3105037)</b>									
ES1322053-003	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	10.2	10.8	6.1	0% - 50%
ES1322124-007	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	10.3	9.7	5.4	0% - 50%
<b>EA055: Moisture Content (QC Lot: 3105038)</b>									
ES1322146-007	MB_MW03_1.0	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	10.6	11.1	4.7	0% - 50%
ES1322147-012	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	10.6	9.8	7.7	0% - 50%
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3111310)</b>									
ES1322145-005	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	8	8	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	4	4	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	8	8	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	8	8	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	24	25	4.6	No Limit
ES1322146-003	MB_MW05_0.5	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	10	10	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	28	40	36.7	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	10	10	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	15	13	11.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	18	21	13.3	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	42	61	37.3	0% - 50%
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3111311)</b>									
ES1322145-005	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1322146-003	MB_MW05_0.5	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3105566)</b>									
ES1322146-001	MI_SB07_0.2	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3105566) - continued</b>									
ES1322146-001	ML_SB07_0.2	EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
ES1322146-011	D02_091013_TS	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3105566)</b>									
ES1322146-001	ML_SB07_0.2	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1,2,3-cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
ES1322146-011	D02_091013_TS	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit





Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3105566) - continued</b>									
ES1322146-011	D02_091013_TS	EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3104228)</b>									
ES1322124-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	388	324	17.8	0% - 20%
ES1322146-003	MB_MW05_0.5	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3105565)</b>									
ES1322146-001	MI_SB07_0.2	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1322146-011	D02_091013_TS	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3104228)</b>									
ES1322124-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	496	432	13.9	0% - 20%
ES1322146-003	MB_MW05_0.5	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3105565)</b>									
ES1322146-001	MI_SB07_0.2	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
ES1322146-011	D02_091013_TS	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3104228)</b>									
ES1322124-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	0.4	0.3	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	8.8	8.0	9.2	0% - 50%
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	6.6	5.5	18.2	0% - 50%
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	32.4	27.8	15.2	0% - 20%
			106-42-3						

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 Work Order : ES1322146 Amendment 1  
 Client : ENVIRO RESOURCES MANAGEMENT  
 Project : MT PIPER SOILS



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
<b>EP080: BTEXN (QC Lot: 3104228) - continued</b>										
ES1322124-001	Anonymous	EP080: ortho-Xylene	95-47-6	0.5	mg/kg	7.6	6.9	10.0	0% - 50%	
		EP080: Naphthalene	91-20-3	1	mg/kg	2	2	0.0	No Limit	
ES1322146-003	MB_MW05_0.5	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit		



### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3111310)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	113	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	102	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	121	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	115	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	106	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	117	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	96.2	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	119	81	133	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3111311)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	86.6	66	112	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3105566)</b>									
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	100	74	116	
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	101	74	116	
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	99.6	72	116	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	92.2	69	123	
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	83.8	60.3	117	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	94.7	69	117	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	89.7	68	112	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	95.2	73	117	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	90.8	76.4	114	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	89.8	57	111	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	88.9	68.9	112	
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	25.4	3.9	57	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3105566)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	101	80	124	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	101	77	123	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	100	79	123	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	97.9	77	123	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	98.6	79	123	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	99.9	79	123	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	100	79	123	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	100	79	125	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	94.6	73	121	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	102	81	123	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3105566) - continued</b>									
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	93.9	70	118	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	97.2	77	123	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	92.4	76	122	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	84.2	71	113	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	82.1	71.7	113	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	99.2	72.4	114	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3104228)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	113	68.4	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3105565)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	101	71	131	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	99.6	74	138	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	90.4	64	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3104228)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	114	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3105565)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	96.3	70	130	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	98.0	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	
		50	mg/kg	----	150 mg/kg	85.9	63	131	
<b>EP080: BTEXN (QCLot: 3104228)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	109	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	100	62	128	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	90.9	58	118	
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	93.7	60	120	
	106-42-3								
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	88.7	60	120	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	102	62	138	

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report				
				Spike Concentration	Spike Recovery(%)		Recovery Limits (%)	
					MS	Low	High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3111310)</b>								
ES1322145-005	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	104	70	130	
		EG005T: Cadmium	7440-43-9	50 mg/kg	97.8	70	130	



Sub-Matrix: SOIL

				Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EG005T: Total Metals by ICP-AES (QCLot: 3111310) - continued</b>							
ES1322145-005	Anonymous	EG005T: Chromium	7440-47-3	50 mg/kg	105	70	130
		EG005T: Copper	7440-50-8	125 mg/kg	104	70	130
		EG005T: Lead	7439-92-1	125 mg/kg	105	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	102	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	100	70	130
		EG005T: Zinc	7440-66-6	125 mg/kg	98.7	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3111311)</b>							
ES1322145-005	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	102	70	130
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3105566)</b>							
ES1322146-001	MI_SB07_0.2	EP075(SIM): Phenol	108-95-2	10 mg/kg	90.4	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	91.4	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	89.0	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	85.2	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	75.0	20	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3105566)</b>							
ES1322146-001	MI_SB07_0.2	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	90.8	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	91.0	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3104228)</b>							
ES1322124-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	# Not Determined	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3105565)</b>							
ES1322146-001	MI_SB07_0.2	EP071: C10 - C14 Fraction	----	640 mg/kg	92.9	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	89.8	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	75.8	52	132
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3104228)</b>							
ES1322124-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	# Not Determined	70	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3105565)</b>							
ES1322146-001	MI_SB07_0.2	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	119	73	137
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	81.4	53	131
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	60.6	52	132
<b>EP080: BTEXN (QCLot: 3104228)</b>							
ES1322124-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	84.0	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	91.4	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	119	70	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	# Not Determined	70	130
			106-42-3				



Sub-Matrix: SOIL

				Matrix Spike (MS) Report			
Laboratory sample ID		Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery(%) MS	Recovery Limits (%) Low High
<b>EP080: BTEXN (QCLot: 3104228) - continued</b>							
ES1322124-001		Anonymous	EP080: ortho-Xylene	95-47-6	2.5 mg/kg	79.2	70 130
			EP080: Naphthalene	91-20-3	2.5 mg/kg	108	70 130

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report							
Laboratory sample ID		Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS MSD		Recovery Limits (%) Low High		RPDs (%) Value Control Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3104228)</b>											
ES1322124-001		Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	# Not Determined	----	70	130	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3104228)</b>											
ES1322124-001		Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	# Not Determined	----	70	130	----	----
<b>EP080: BTEXN (QCLot: 3104228)</b>											
ES1322124-001		Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	84.0	----	70	130	----	----
			EP080: Toluene	108-88-3	2.5 mg/kg	91.4	----	70	130	----	----
			EP080: Ethylbenzene	100-41-4	2.5 mg/kg	119	----	70	130	----	----
			EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	# Not Determined	----	70	130	----	----
				106-42-3							
			EP080: ortho-Xylene	95-47-6	2.5 mg/kg	79.2	----	70	130	----	----
			EP080: Naphthalene	91-20-3	2.5 mg/kg	108	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3105565)</b>											
ES1322146-001		MI_SB07_0.2	EP071: C10 - C14 Fraction	----	640 mg/kg	92.9	----	73	137	----	----
			EP071: C15 - C28 Fraction	----	3140 mg/kg	89.8	----	53	131	----	----
			EP071: C29 - C36 Fraction	----	2860 mg/kg	75.8	----	52	132	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3105565)</b>											
ES1322146-001		MI_SB07_0.2	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	119	----	73	137	----	----
			EP071: >C16 - C34 Fraction	----	4800 mg/kg	81.4	----	53	131	----	----
			EP071: >C34 - C40 Fraction	----	2400 mg/kg	60.6	----	52	132	----	----
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3105566)</b>											
ES1322146-001		MI_SB07_0.2	EP075(SIM): Phenol	108-95-2	10 mg/kg	90.4	----	70	130	----	----
			EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	91.4	----	70	130	----	----
			EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	89.0	----	60	130	----	----
			EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	85.2	----	70	130	----	----
			EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	75.0	----	20	130	----	----



Sub-Matrix: SOIL

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
				Concentration	MS	MSD	Low	High	Value	Control Limit
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3105566)</b>										
ES1322146-001	MI_SB07_0.2	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	90.8	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	91.0	----	70	130	----	----
<b>EG005T: Total Metals by ICP-AES (QCLot: 3111310)</b>										
ES1322145-005	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	104	----	70	130	----	----
		EG005T: Cadmium	7440-43-9	50 mg/kg	97.8	----	70	130	----	----
		EG005T: Chromium	7440-47-3	50 mg/kg	105	----	70	130	----	----
		EG005T: Copper	7440-50-8	125 mg/kg	104	----	70	130	----	----
		EG005T: Lead	7439-92-1	125 mg/kg	105	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	102	----	70	130	----	----
		EG005T: Selenium	7782-49-2	50 mg/kg	100	----	70	130	----	----
		EG005T: Zinc	7440-66-6	125 mg/kg	98.7	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3111311)</b>										
ES1322145-005	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	102	----	70	130	----	----



## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1322146</b>	Page	: 1 of 7
Amendment	: <b>1</b>		
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
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Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: MT PIPER SOILS	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 11-OCT-2013
Sampler	: TS	Issue Date	: 25-OCT-2013
Order number	: 0207423		
Quote number	: SY/278/13 V3	No. of samples received	: 16
		No. of samples analysed	: 11

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EA055: Moisture Content</b>								
<b>Soil Glass Jar - Unpreserved (EA055-103)</b> MI_SB07_0.2,	MB_MW04_0.5	08-OCT-2013	----	----	----	14-OCT-2013	22-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EA055-103)</b> MB_MW05_0.5, MB_MW01_0.2, MB_MW03_1.0, MB_MW02_0.2, D02_091013_TS	ML_MW08_0.5, MB_MW03_0.2, MI_SB04_0.2, D01_091013_TS,	09-OCT-2013	----	----	----	14-OCT-2013	23-OCT-2013	✓
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
<b>Snap Lock Bag (EA200)</b> MI_SB07_0.2,	MB_MW04_0.5	08-OCT-2013	---	06-APR-2014	----	18-OCT-2013	16-APR-2014	✓
<b>Snap Lock Bag (EA200)</b> MB_MW05_0.5, MB_MW03_0.2	ML_MW08_0.5,	09-OCT-2013	---	07-APR-2014	----	18-OCT-2013	16-APR-2014	✓
<b>EG005T: Total Metals by ICP-AES</b>								
<b>Soil Glass Jar - Unpreserved (EG005T)</b> MI_SB07_0.2,	MB_MW04_0.5	08-OCT-2013	17-OCT-2013	06-APR-2014	✓	18-OCT-2013	06-APR-2014	✓
<b>Soil Glass Jar - Unpreserved (EG005T)</b> MB_MW05_0.5, MB_MW01_0.2, MB_MW03_1.0, MB_MW02_0.2, D02_091013_TS	ML_MW08_0.5, MB_MW03_0.2, MI_SB04_0.2, D01_091013_TS,	09-OCT-2013	17-OCT-2013	07-APR-2014	✓	18-OCT-2013	07-APR-2014	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
<b>Soil Glass Jar - Unpreserved (EG035T)</b> MI_SB07_0.2,	MB_MW04_0.5	08-OCT-2013	17-OCT-2013	05-NOV-2013	✓	18-OCT-2013	05-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EG035T)</b> MB_MW05_0.5, MB_MW01_0.2, MB_MW03_1.0, MB_MW02_0.2, D02_091013_TS	ML_MW08_0.5, MB_MW03_0.2, MI_SB04_0.2, D01_091013_TS,	09-OCT-2013	17-OCT-2013	06-NOV-2013	✓	18-OCT-2013	06-NOV-2013	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP071)</b> MI_SB07_0.2,	MB_MW04_0.5	08-OCT-2013	16-OCT-2013	22-OCT-2013	✓	16-OCT-2013	25-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP071)</b> MB_MW05_0.5, MB_MW01_0.2, MB_MW03_1.0, MB_MW02_0.2, D02_091013_TS	ML_MW08_0.5, MB_MW03_0.2, MI_SB04_0.2, D01_091013_TS,	09-OCT-2013	16-OCT-2013	23-OCT-2013	✓	16-OCT-2013	25-NOV-2013	✓
<b>EP075(SIM)A: Phenolic Compounds</b>								
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MI_SB07_0.2,	MB_MW04_0.5	08-OCT-2013	16-OCT-2013	22-OCT-2013	✓	16-OCT-2013	25-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MB_MW05_0.5, MB_MW01_0.2, MB_MW03_1.0, MB_MW02_0.2, D02_091013_TS	ML_MW08_0.5, MB_MW03_0.2, MI_SB04_0.2, D01_091013_TS,	09-OCT-2013	16-OCT-2013	23-OCT-2013	✓	16-OCT-2013	25-NOV-2013	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MI_SB07_0.2,	MB_MW04_0.5	08-OCT-2013	16-OCT-2013	22-OCT-2013	✓	16-OCT-2013	25-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MB_MW05_0.5, MB_MW01_0.2, MB_MW03_1.0, MB_MW02_0.2, D02_091013_TS	ML_MW08_0.5, MB_MW03_0.2, MI_SB04_0.2, D01_091013_TS,	09-OCT-2013	16-OCT-2013	23-OCT-2013	✓	16-OCT-2013	25-NOV-2013	✓
<b>EP080: BTEXN</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b> MI_SB07_0.2,	MB_MW04_0.5	08-OCT-2013	14-OCT-2013	22-OCT-2013	✓	14-OCT-2013	22-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MB_MW05_0.5, MB_MW01_0.2, MB_MW03_1.0, MB_MW02_0.2, D02_091013_TS	ML_MW08_0.5, MB_MW03_0.2, MI_SB04_0.2, D01_091013_TS,	09-OCT-2013	14-OCT-2013	23-OCT-2013	✓	14-OCT-2013	23-OCT-2013	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b> MI_SB07_0.2,	MB_MW04_0.5	08-OCT-2013	14-OCT-2013	22-OCT-2013	✓	14-OCT-2013	22-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MB_MW05_0.5, MB_MW01_0.2, MB_MW03_1.0, MB_MW02_0.2, D02_091013_TS	ML_MW08_0.5, MB_MW03_0.2, MI_SB04_0.2, D01_091013_TS,	09-OCT-2013	14-OCT-2013	23-OCT-2013	✓	14-OCT-2013	23-OCT-2013	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Moisture Content	EA055-103	4	40	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	13	15.4	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	14	14.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	13	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	14	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	13	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	14	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	13	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	14	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Asbestos Identification in bulk solids	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TPH - Semivolatle Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (2013) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.



## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Matrix Spike (MS) Recoveries</b>							
EP080/071: Total Petroleum Hydrocarbons	ES1322124-001	Anonymous	<b>C6 - C9 Fraction</b>	----	Not Determined	----	<b>MS recovery not determined, background level greater than or equal to 4x spike level.</b>
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	ES1322124-001	Anonymous	<b>C6 - C10 Fraction</b>	C6_C10	Not Determined	----	<b>MS recovery not determined, background level greater than or equal to 4x spike level.</b>
EP080: BTEXN	ES1322124-001	Anonymous	<b>meta- &amp; para-Xylene</b>	108-38-3 106-42-3	Not Determined	----	<b>MS recovery not determined, background level greater than or equal to 4x spike level.</b>

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.

#### Regular Sample Surrogates

Sub-Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Samples Submitted</b>							
EP080S: TPH(V)/BTEX Surrogates	ES1322146-011	D02_091013_TS	<b>4-Bromofluorobenzene</b>	460-00-4	132 %	71.6-130.0 %	<b>Recovery greater than upper data quality objective</b>

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- No Analysis Holding Time Outliers exist.

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.





# CHAIN OF CUSTODY

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please tick ->

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Ph: 02 4225 3125 E: wollongong@alsglobal.com

### TURNAROUND REQUIREMENTS:

Standard TAT may be longer for some tests e.g. Ultra Trace Organics

Standard TAT (last due date)  
 Non Standard or Urgent TAT (last due date):

### FOR LABORATORY USE ONLY (Check)

CLIENT: ERM	OFFICE: Sydney	PROJECT: Project Symphony - MP	ORDER NUMBER: 0207423	PROJECT MANAGER: Jonathan Lekawan	SAMPLER: Thavone Shaw, Gavin Powell	COC emailed to ALS? <input checked="" type="checkbox"/>	COC Reports to (will default to PM if no other addresses are listed): Symphony DeltaWest@erm.com	Email Invoices to (will default to PM if no other addresses are listed): Symphony.DeltaWest@erm.com	COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:
TURNAROUND REQUIREMENTS:			ALS QUOTE NO.: SY1727813	CONTRACT PH: 8584 8888	SAMPLER MOBILE: 0401657352	RELINQUISHED BY: Gavin Powell	RECEIVED BY: Steven	DATE/TIME: 15/10/15 0730	DATE/TIME: 16/10/15 8:15
COC SEQUENCE NUMBER (check)			COC: 1 2 3 4 5 6 7		OFF: 1 2 3 4 5 6 7		RELINQUISHED BY:		RECEIVED BY:
Freeze / frozen ice bricks present upon receipt?			Yes		No		N/A		
Random Sample Temperature on receipt:			Yes		No		N/A		
Other comments:									

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below)	TOTAL CONTAINERS (refer to	S-27 (8 metals - As, Cd, Cr, Cu, Ni, Pb, Zn, Hg, TRH/BTEX, PAH/Phenols)	Additional Metal - Se	Asbestos	VOC Scan	PCB	Particle Sizing (hydrometer), TOC - EP004	pH, Exchangeable Cations plus ECEC	Additional Information
16	MD-MW01-0-1	16/10	"	ST, B	2								X
1	MD-MW01-0-5	"	"	ST, B	2								X
2	MD-MW01-1-0	"	"	ST	1	X	X						X
3	MK-SB15-0-1	"	"	ST, B	2	X	X						X
17	MK-SB15-0-5	"	"	ST	1								X
15	MK-SB16-0-1	"	"	ST	1								X
4	MK-SB16-0-5	"	"	ST, B	2	X	X						X
19	MK-SB16-1-0	"	"	ST	1								X
5	MK-SB09-0-1	"	"	ST, B	2	X	X						X
6	MK-SB14-0-1	"	"	ST, B	2								X
20	MK-SB14-0-5	"	"	ST	1								X
7	MK-SB14-1-0	"	"	ST	1	X	X						X
TOTAL													

Environmental Division  
Sydney  
Work Order  
**ES13222434**



Telephone: + 61-2-8784 8555

Water Container Codes: F = Unpreserved Plastic; N = Nitric Preserved Plastic; ORG = Nitric Preserved ORG; SH = Sodium Hydroxide Preserved Plastic; AG = Amber Glass; V = VOA Via HCl Preserved; VB = VOA Via Sodium Bisulfate Preserved; VS = VOA Via Sulfuric Preserved; AV = Airfreight Unpreserved Via SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ABS = Plastic Bag for Acid Suphate Solis; B = Unpreserved Bag.



# CHAIN OF CUSTODY

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Ph: 02 4928 9433 E: samples.newcastle@alsglobal.com  
DUNEDIN 413 Geary Place, North Sydney NSW 2060  
Ph: 02 4423 2683 E: hove@alsglobal.com  
DUNEDIN 10 Hadley Way, Malaga WA 6090  
Ph: 08 9206 7855 E: samples.perth@alsglobal.com

DUNEDIN 277-289 Woodson Road, Smithfield NSW 2166  
Ph: 02 8754 5555 E: samples.syd@alsglobal.com  
DUNEDIN 14-15 Darna Court, Bona QLD 4819  
Ph: 07 4795 0800 E: brennie.environment@alsglobal.com  
DUNEDIN 99 Kenny Street, Midvale NSW 2205  
Ph: 02 4225 3155 E: kenny@alsglobal.com

TURNAROUND REQUIREMENTS:  
 Standard TAT (last due date):  
 Non Standard or Urgent TAT (last due date):

FOR LABORATORY USE ONLY (Circle)

Office: Sydney	ALS QUOTE NO.: SY127813	COC SEQUENCE NUMBER (Circle)	1	2	3	4	5	6	7
Project: Project Symphony - MP	Project Manager: Jonathan Luskowski	Sampler: Travone Shaw/Gavin Powell	Relinquished By: Gavin Powell	Relinquished By: Steven	Received By:	Received By:	Received By:	Received By:	Received By:
Order Number: 0207423	Contact PH:	Sampler Mobile:	Relinquished Date/Time: 15/10/13 0930	Relinquished Date/Time: 16/10/13 8:15	Received Date/Time:	Received Date/Time:	Received Date/Time:	Received Date/Time:	Received Date/Time:
Project Manager: Jonathan Luskowski	Contract PH:	Sampler Mobile:	Relinquished Date/Time: 15/10/13 0930	Relinquished Date/Time: 16/10/13 8:15	Received Date/Time:	Received Date/Time:	Received Date/Time:	Received Date/Time:	Received Date/Time:

COE emailed to ALS? (YES / NO)  YES /  NO EDD FORMAT (or default): pdf/csv/excel

Email Reports to (will default to PM if no other addresses are listed): Symphony, Delia.West@als.com

Email Invoice to (will default to PM if no other addresses are listed): Symphony, Delia.West@als.com

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below	TOTAL CONTAINERS	S-27 (8 metals - As, Cd, Cr, Cu, Ni, Pb, Zn, Hg, TRHBTEX, PAH/Phenols)	Additional Metal - Se	Asbestos	VOC Scan	PCB	Particle Sizing (hydrometer), TOC - EP004	pH, Exchangeable Cations plus ECEC	Additional Information
8	MK-SR10-0.1	10/10/13	Soil	ST, B	2			X					
9	MK-SR10-0.85	10/10/13	"	ST	1								
9	MK-SR10-1.2	11/10/13	"	ST	1	X	X						
22	D-101013-01-CP	10/10/13	"	ST	1								
10	D-111013-01-CP	11/10/13	"	ST	1	X	X						
11	P-111013-01-CP	11/10/13	"	ST	1	X	X						
23	MC-MW03-0.3	"	"	ST, B	2								
12	MC-MW03-0.7	"	"	ST, B	2	X	X						
13	MC-MW03-1.0	"	"	ST	1				X				
14	MC-MW02-0.3	"	"	ST, B	2			X					
14	MC-MW02-0.7	"	"	ST	1								
24	MC-MW02-0.7	"	"	ST	1								
15	MC-MW02-1.1	"	"	ST	1	X	X						
TOTAL													

Matrix Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airtight Unpreserved Plastic; V = VOA Via HCl Preserved; VB = VOA Via Sodium Bisulfate Preserved; VS = VOA Via Sulfuric Preserved; AV = Airtight Unpreserved Via SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formic Acid Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

DANCECROFT 21 Burns Road, Pootah, SA 5096  
 Ph: 08 4639 0900 E: info@als.com.au  
 DUNEDIN 33 Spence Street, Seaford QLD 4053  
 Ph: 07 3243 7222 E: samples.dunedin@als.com.au  
 DUNEDIN 40 Callender Drive, Clontarf QLD 4060  
 Ph: 07 3243 5000 E: samples.dunedin@als.com.au  
 DUNEDIN 76 Hingour Road, Mackay QLD 4740  
 Ph: 07 4644 0177 E: mackay@als.com.au  
 DUNEDIN 24 Westgate Road, Springvale VIC 3171  
 Ph: 03 8569 5000 E: samples.melbourne@als.com.au  
 DUNEDIN 27 Sydney Road, Mackay NSW 2890  
 Ph: 02 6322 9735 E: mackay.nsw@als.com.au  
 DUNEDIN 5 Rose Gum Road, Warwick NSW 2304  
 Ph: 02 4688 5000 E: samples.newcastle@als.com.au  
 DUNEDIN 4113 Geary Park North, Nowra NSW 2541  
 Ph: 02 4423 2053 E: nowra@als.com.au  
 DUNEDIN 10 Hood View, Manjimup WA 5260  
 Ph: 08 9209 7655 E: samples.perth@als.com.au  
 DUNEDIN 277 269 Woodcock Road, Smithfield NSW 2164  
 Ph: 02 9164 6625 E: samples.sydney@als.com.au  
 DUNEDIN 14-15 Deanna Court, Boro QLD 4818  
 Ph: 07 4198 0800 E: townsville.environment@als.com.au  
 DUNEDIN 69 Kerry Street, Wollongong NSW 2500  
 Ph: 02 4225 3125 E: townsville@als.com.au

**CLIENT:** ERM  
**OFFICE:** Sydney  
**PROJECT:** Project Symphony - WW 1P  
**ORDER NUMBER:** 7267420-0207423  
**PROJECT MANAGER:** Jonathan Lohawaki  
**SAMPLER:** Chua-Tattana-Rose Pascoe  
**SAMPLER MOBILE:** A. A.  
**COC emailed to ALS?** (YES / NO)  
**EDD FORMAT (or default):** pdf/cv/seat  
**Email Reported to:** (will default to PM if no other addresses are listed): Symphony DellaWest@erm.com  
**Email Invoiced to:** (will default to PM if no other addresses are listed): Symphony DellaWest@erm.com  
**COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:**

**TURNAROUND REQUIREMENTS:**  
 Standard TAT (list due date):  
 Non Standard or Urgent TAT (list due date):  
 Ultra Trace Organics) SV/27/13

**RELINQUISHED BY:** A. A. HAWAKI  
**DATE/TIME:** 15/10/13  
**RECEIVED BY:** Steven  
**DATE/TIME:** 16/10/13 8:15  
**RELINQUISHED BY:**  
**DATE/TIME:**  
**RECEIVED BY:**  
**DATE/TIME:**

**FOR LABORATORY USE ONLY (Circle)**  
 Custody Seal intact? Yes No N/A  
 Free ice / frozen ice bricks present upon receipt? Yes No N/A  
 Random Sample Temperature on Receipt: °C  
 Other comment:

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (codes below)	TOTAL CONTAINERS (refer to)	ANALYSIS REQUIRED INCLUDING SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (filtered bottle required).							Additional Information		
						S-27 (8 metals - As, Cd, Cr, Cu, Ni, Pb, Zn, Hg, TRH/BTEX, PAH/Phenols)	Additional Metal - Se	Asbestos	VOC Scan	PCB	Particle Sizing (hydrometer), TOC-EP004	pH, Exchangeable Cations plus ECEC		TRAH C6-C9 BTEX	Comments on likely contaminant levels, dilutions, or samples requiring specific GC analysis etc.
25	ML-MM17-012	14.10.13	S		2	X	X	X							
26	ML-MM23-011				2	X	X	X							
27	ML-MM20-011				2	X	X	X							
28	ML-MM21-011				2	X	X	X							
29	ML-MM19-011	14.10.13	S		2	X	X	X							
30	Trip Spike	8.10.13	S		1										
31	Trip Blank	"	S		1										
32	TSC														
<b>TOTAL</b>															

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide Preserved Plastic; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airflight Unpreserved Plastic  
 V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Sulphate Preserved; VS = VOA Vial Sulfate Preserved; AV = Airflight Unpreserved Amber Glass; H = HCl preserved Plastic; H9 = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass.  
 Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ABS = Plastic Bag for Acid Sulphate Solids; B = Unpreserved Bag.



# CHAIN OF CUSTODY

ALS Laboratory:  
please tick →

DMOBIL A05 21 Burma Road Pacific SA 5055  
 Ph: 08 8339 0930 E: info@als.com.au  
 DRIESBANK 32 Sharn Street Stirling QLD 4053  
 Ph: 07 3243 7222 E: samples@als.com.au  
 GILGADSTONE 46 Calamondin Drive Crompton QLD 4080  
 Ph: 07 7471 5600 E: gladstone@als.com.au  
 DMOCKY 78 Harbour Road Mackay QLD 4740  
 Ph: 07 4644 0777 E: mackay@als.com.au  
 DMOBILBOURNE 24 Westall Road Springvale VIC 3171  
 Ph: 03 8519 5500 E: samples@als.com.au  
 DMOODGEE 27 Sydney Road Mudgee NSW 2850  
 Ph: 02 6372 6735 E: mudgee@als.com.au  
 DMOVICAST 55 Gora Gum Road Warrackbeery NSW 2304  
 Ph: 02 6699 4433 E: warrackbeery@als.com.au  
 DMOVWRA 473 Gentry Place North Nowra NSW 2341  
 Ph: 02 4253 2083 E: nowra@als.com.au  
 DMPERTH 10 Hord Way Malaga WA 6090  
 Ph: 08 8209 7555 E: samples.perth@als.com.au  
 DMSYDNEY 2172-2193 Theodora Road Smithfield NSW 2164  
 Ph: 02 8764 8555 E: samples.syd@als.com.au  
 DMTOWNSVILLE 14-15 Deanna Court Brisbane QLD 4018  
 Ph: 07 4786 6500 E: townsville@als.com.au  
 DMWOLLONGONG 89 Kenny Street Wollongong NSW 2500  
 Ph: 02 4225 3126 E: wollongong@als.com.au

### TURNAROUND REQUIREMENTS:

Standard TAT (List due date)  
 Non Standard or urgent TAT (List due date)

(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)

ALS QUOTE NO.: SY2728/13

ORDER NUMBER: 0207423

PROJECT MANAGER: Jonathan Lekawski

CONTACT PH: 8584 8888

SAMPLER: Thayne Shaw/Gavin Powell

SAMPLER MOBILE: 0410163752

EDD FORMAT (or default): pdf/csv/edat

COC emailed to ALS? YES /  NO

Email Reports to (will default to PM if no other addresses are listed): Symphony DeltaWest@erm.com

Email Invoice to (will default to PM if no other addresses are listed): Symphony DeltaWest@erm.com

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

### FOR LABORATORY USE ONLY (Circle)

Classify Seal Index?	Yes	No	N/A
Freeze / Freeze to prevent sample upon receipt?	Yes	No	N/A
Ratemon Sample Temperature on Receipt			
Other comment:			

RELINQUISHED BY: Gavin Powell  
 DATE/TIME: 15/10/15 0730

RECEIVED BY: Steven  
 DATE/TIME: 16/10/15 8:15

RELINQUISHED BY:  
 DATE/TIME:

RECEIVED BY:  
 DATE/TIME:

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below)	TOTAL CONTAINERS (refer to	ANALYSIS REQUIRED including SUITES (NB: Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).	Additional Metal - Se	Asbestos	VOC Scan	PCB	Particle Sizing (hydrometer), TOC-EP004	pH, Exchangeable Cations plus ECEC	Additional Information
16	MD-MW01-0.1	6/01	"	ST, B	2	S-27 (8 metals- As, Cd, Cr, Cu, Ni, Pb, Zn, Hg, TRH/BTEX, PAH/Phenols)							HOLD
1	MD-MW01-0.5	"	"	ST, B	2								X
2	MD-MW01-1.0	"	"	ST	1		X						X
3	MK-SB15-0.1	"	"	ST, B	2		X						X
17	MK-SB15-0.5	"	"	ST	1								X
18	MK-SB16-0.1	"	"	ST	1								X
4	MK-SB16-0.5	"	"	ST, B	2		X						X
19	MK-SB16-1.0	"	"	ST	1								X
5	MK-SB09-0.1	"	"	ST, B	2		X						X
6	MK-SB14-0.1	"	"	ST, B	2		X						X
20	MK-SB14-0.5	"	"	ST	1								X
7	MK-SB14-1.0	"	"	ST	1		X						X
<b>TOTAL</b>													

**Water Container Codes:** F = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide Preserved Plastic; AG = Amber Glass  
 V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulfate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfree/Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic  
 Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Solis; B = Unpreserved Bag.

**Environmental Division**  
 Sydney  
 Work Order  
**ES13222434**

Telephone: + 61-2-8784 8555



**CHAIN OF CUSTODY**  
ALS Laboratory  
please tick ->

DADELADE 21 Burns Road Rockdale SA 5065  
Ph: 08 8550 0800 E: rockdale@als.com.au  
DUNEDIN 32 Strand Street Dunedin QLD 4003  
Ph: 07 3243 7222 E: samples.dunedin@als.com.au  
DUNEDIN 46 Calverton Drive Chion QLD 4650  
Ph: 07 4741 5600 E: gawaine@als.com.au  
DUNEDIN 78 Harbour Road Mackay QLD 4740  
Ph: 07 4844 0177 E: mackay@als.com.au  
DUNEDIN 24 Westral Road Springvale VIC 3717  
Ph: 03 8549 5800 E: samples.melbourne@als.com.au  
DUNEDIN 27 Sydney Road Mudgee NSW 2850  
Ph: 02 6972 6735 E: mudgee@als.com.au  
DUNEDIN 1155 Ross Gum Road Yarrabook NSW 2504  
Ph: 02 4593 3400 E: samples.yarrabook@als.com.au  
DUNEDIN 47/3 Cheery Place North Ryde NSW 2114  
Ph: 02 9424 2000 E: northryde@als.com.au  
DUNEDIN 10 Hill Way Manly WA 6050  
Ph: 08 9209 7655 E: samples.perth@als.com.au  
DUNEDIN 272 280 Woodcock Road Smithfield NSW 2164  
Ph: 02 0794 8555 E: samples.smyth@als.com.au  
LITON/SWILE 14/15 Deanna Court Bank QLD 4014  
Ph: 07 4756 6600 E: townsville.environmental@als.com.au  
DUNEDIN 99 Karam Street Wollongong NSW 2500  
Ph: 02 4225 9125 E: parker@als.com.au

CLIENT: ERM  
OFFICE: Sydney  
PROJECT: Project Symphony - MP  
ORDER NUMBER: 0207423  
PROJECT MANAGER: Jonathan Lefkewski  
SAMPLER: Thayne Shaw / Gavin Powell  
COC emailed to ALS? ( YES / NO )  
Email Reports to (will default to PM if no other addresses are listed): Symphony.DeltaWest@erm.com  
Email Invoice to (will default to PM if no other addresses are listed): Symphony.DeltaWest@erm.com

TURNAROUND REQUIREMENTS:  
(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)  
ALS QUOTE NO.: SYZ78/13  
Standard TAT (List due date):   
Non Standard or urgent TAT (List due date):

RELINQUISHED BY: Gavin Powell  
DATE/TIME: 15/10/13 0930  
RECEIVED BY: Steven  
DATE/TIME: 16/10/13 8:15  
RELINQUISHED BY:  
DATE/TIME:  
RECEIVED BY:  
DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below)	TOTAL CONTAINERS	ANALYSIS REQUIRED (including SUITES (NB: Suite Codes must be listed to attract suite price) when Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)).							Additional Information		
						S-27 (8 metals- As, Cd, Cr, Cu, Ni, Pb, Zn, Hg, TRH/BTEX, PAH/Phenols)	Additional Metal - Se	Asbestos	VOC Scan	PCB	Particle Sizing (hydrometer), TOC-EP004	pH, Exchangeable Cations plus ECEC		HOLD	Comments on likely contaminant levels, dilutions, or samples requiring specific dc analysis etc.
5	MK-SB10-0.1	10/10/13	Soil	ST,B	2	X									
6	MK-SB10-0.85	10/10/13	"	ST	1	X									
9	MK-SB10-1.2	11/10/13	"	ST	1	X									
22	D-101013-01-CP	10/10/13	"	ST	1	X									
10	D-1101013-01-CP	11/10/13	"	ST	1	X									
4	P-1101013-01-CP	11/10/13	"	ST	1	X									
33	MC-MW03-0.3	"	"	ST,B	2	X									
12	MC-MW03-0.7	"	"	ST,B	2	X									
13	MC-MW03-1.0	"	"	ST	1	X									
14	MC-MW02-0.3	"	"	ST,B	2	X									
24	MC-MW02-0.7	"	"	ST	1	X									
15	MC-MW02-1.1	"	"	ST	1	X									
TOTAL															

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; ST = Sodium Hydroxide Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic  
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;  
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

<b>Work Order</b>	: <b>ES1322434</b>		
<b>Amendment</b>	: <b>2</b>		
<b>Client</b>	: <b>ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: MR JONATHAN LEKAWSKI	<b>Contact</b>	: Barbara Hanna
<b>Address</b>	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: jonathan.lekawski@erm.com	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: PROJECT SYMPHONY - MP	<b>Page</b>	: 1 of 3
<b>Order number</b>	: ----		
<b>C-O-C number</b>	: ----	<b>Quote number</b>	: ES2013ENVRES0370 (SY/278/13 V3)
<b>Site</b>	: ----		
<b>Sampler</b>	: T.SHAW/G.POWELL	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement

#### Dates

Date Samples Received	: 16-OCT-2013	Issue Date	: 14-JAN-2014 14:05
Client Requested Due Date	: 14-JAN-2014	Scheduled Reporting Date	: <b>14-JAN-2014</b>

#### Delivery Details

Mode of Delivery	: Carrier	Temperature	: 6°C - Ice bricks present
No. of coolers/boxes	: 2 HARD	No. of samples received	: 23
Security Seal	: Intact.	No. of samples analysed	: 14

#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Asbestos analysis will be conducted by ALS Newcastle.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Sample T\_111013\_01\_GP forwarded to Envirolab as per COC.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.







Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) WATER No analysis requested
ES1322434-023	11-OCT-2013 15:00	MC_MW03_0.3	✓
ES1322434-024	11-OCT-2013 15:00	MC_MW02_0.7	✓

### Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

### Requested Deliverables

#### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

#### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
 Email jonathan.lekawski@erm.com  
 Email jonathan.lekawski@erm.com  
 Email jonathan.lekawski@erm.com  
 Email jonathan.lekawski@erm.com  
 Email jonathan.lekawski@erm.com  
 Email jonathan.lekawski@erm.com  
 Email jonathan.lekawski@erm.com  
 Email jonathan.lekawski@erm.com

#### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email symphony.deltawest@erm.com  
 Email symphony.deltawest@erm.com  
 Email symphony.deltawest@erm.com  
 Email symphony.deltawest@erm.com  
 Email symphony.deltawest@erm.com  
 Email symphony.deltawest@erm.com  
 Email symphony.deltawest@erm.com  
 Email symphony.deltawest@erm.com  
 Email symphony.deltawest@erm.com

#### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>ES1322434</b> <b>Amendment</b> : <b>2</b> <b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : <b>MR JONATHAN LEKAWSKI</b> <b>Address</b> : <b>GROUND FLOOR</b> <b>33 SAUNDERS STREET, PYRMONT NSW 2009</b> <b>LOCKED BAG 24</b> <b>BROADWAY NSW, AUSTRALIA 2007</b>  <b>E-mail</b> : <b>jonathan.lekawski@erm.com</b> <b>Telephone</b> : <b>+61 02 8584 8888</b> <b>Facsimile</b> : <b>+61 02 8584 8800</b> <b>Project</b> : <b>PROJECT SYMPHONY - MP</b> <b>Order number</b> : <b>----</b> <b>C-O-C number</b> : <b>----</b> <b>Sampler</b> : <b>T.SHAW/G.POWELL</b> <b>Site</b> : <b>----</b>  <b>Quote number</b> : <b>SY/278/13 V3</b>	<b>Page</b> : 1 of 17  <b>Laboratory</b> : Environmental Division Sydney <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164  <b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555 <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement  <b>Date Samples Received</b> : 16-OCT-2013 <b>Issue Date</b> : 14-JAN-2014  <b>No. of samples received</b> : 23 <b>No. of samples analysed</b> : 14
---	--

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Peter Rennie	Asbestos Identifier	Newcastle - Asbestos



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
^ = This result is computed from individual analyte detections at or above the level of reporting

- **EA200 Legend**
- **EA200 'Am' Amosite (brown asbestos)**
- **EA200 'Ch' Chrysotile (white asbestos)**
- **EA200 'Cr' Crocidolite (blue asbestos)**
- **EA200 'Trace' - Asbestos fibres detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres**
- **EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.**
- **EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.**
- **EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.**
- **This report has been amended and re-released to allow the reporting of additional analytical data.**
- **This report has been amended as a result of misinterpretation of sample identification numbers (IDs). All analysis results are as per the previous report**



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MD_MW01_0.5	MD_MW01_1.0	MK_SB15_0.1	MK_SB16_0.5	MK_SB09_0.1
				10-OCT-2013 15:00	10-OCT-2013 15:00	10-OCT-2013 15:00	10-OCT-2013 15:00	10-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322434-001	ES1322434-002	ES1322434-003	ES1322434-004	ES1322434-005
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	----	17.6	18.6	16.8	23.3
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	----	No	No	No
Asbestos Type	1332-21-4	0.1	--	-	----	-	-	-
Sample weight (dry)	----	0.01	g	622	----	463	478	508
APPROVED IDENTIFIER:	----	-	--	P.RENNIE	----	P.RENNIE	P.RENNIE	P.RENNIE
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	----	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	----	6	<5	9	<5
Cadmium	7440-43-9	1	mg/kg	----	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	----	8	34	11	28
Copper	7440-50-8	5	mg/kg	----	13	19	20	16
Lead	7439-92-1	5	mg/kg	----	15	8	21	9
Nickel	7440-02-0	2	mg/kg	----	9	16	33	14
Zinc	7440-66-6	5	mg/kg	----	35	42	52	37
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	----	<0.1	<0.1	<0.1	<0.1
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	0.1	mg/kg	----	<0.1	----	----	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	----	<0.5	----	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg	----	<0.5	----	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg	----	<0.5	----	----	----
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	----	<0.5	----	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	----	<0.5	----	----	----
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	----	<0.5	----	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	----	<0.5	----	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	----	<0.5	----	----	----
n-Butylbenzene	104-51-8	0.5	mg/kg	----	<0.5	----	----	----
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	----	<5	----	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg	----	<5	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	----	<5	----	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MD_MW01_0.5	MD_MW01_1.0	MK_SB15_0.1	MK_SB16_0.5	MK_SB09_0.1
				10-OCT-2013 15:00	10-OCT-2013 15:00	10-OCT-2013 15:00	10-OCT-2013 15:00	10-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322434-001	ES1322434-002	ES1322434-003	ES1322434-004	ES1322434-005
<b>EP074B: Oxygenated Compounds - Continued</b>								
2-Hexanone (MBK)	591-78-6	5	mg/kg	----	<5	----	----	----
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	----	<0.5	----	----	----
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	----	<0.5	----	----	----
1,2-Dichloropropane	78-87-5	0.5	mg/kg	----	<0.5	----	----	----
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	----	<0.5	----	----	----
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	----	<0.5	----	----	----
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	----	<0.5	----	----	----
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	----	<5	----	----	----
Chloromethane	74-87-3	5	mg/kg	----	<5	----	----	----
Vinyl chloride	75-01-4	5	mg/kg	----	<5	----	----	----
Bromomethane	74-83-9	5	mg/kg	----	<5	----	----	----
Chloroethane	75-00-3	5	mg/kg	----	<5	----	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg	----	<5	----	----	----
1,1-Dichloroethene	75-35-4	0.5	mg/kg	----	<0.5	----	----	----
Iodomethane	74-88-4	0.5	mg/kg	----	<0.5	----	----	----
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	----	<0.5	----	----	----
1,1-Dichloroethane	75-34-3	0.5	mg/kg	----	<0.5	----	----	----
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	----	<0.5	----	----	----
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	----	<0.5	----	----	----
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	----	<0.5	----	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg	----	<0.5	----	----	----
1,2-Dichloroethane	107-06-2	0.5	mg/kg	----	<0.5	----	----	----
Trichloroethene	79-01-6	0.5	mg/kg	----	<0.5	----	----	----
Dibromomethane	74-95-3	0.5	mg/kg	----	<0.5	----	----	----
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	----	<0.5	----	----	----
1,3-Dichloropropane	142-28-9	0.5	mg/kg	----	<0.5	----	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg	----	<0.5	----	----	----
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	----	<0.5	----	----	----
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	----	<0.5	----	----	----
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	----	<0.5	----	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MD_MW01_0.5	MD_MW01_1.0	MK_SB15_0.1	MK_SB16_0.5	MK_SB09_0.1
				10-OCT-2013 15:00	10-OCT-2013 15:00	10-OCT-2013 15:00	10-OCT-2013 15:00	10-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322434-001	ES1322434-002	ES1322434-003	ES1322434-004	ES1322434-005
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	----	<0.5	----	----	----
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	----	<0.5	----	----	----
Pentachloroethane	76-01-7	0.5	mg/kg	----	<0.5	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	----	<0.5	----	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg	----	<0.5	----	----	----
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	----	<0.5	----	----	----
Bromobenzene	108-86-1	0.5	mg/kg	----	<0.5	----	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg	----	<0.5	----	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg	----	<0.5	----	----	----
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	----	<0.5	----	----	----
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	----	<0.5	----	----	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	----	<0.5	----	----	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	----	<0.5	----	----	----
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	----	<0.5	----	----	----
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	----	<0.5	----	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg	----	<0.5	----	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg	----	<0.5	----	----	----
Bromoform	75-25-2	0.5	mg/kg	----	<0.5	----	----	----
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	5	mg/kg	----	<5	----	----	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	----	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MD_MW01_0.5	MD_MW01_1.0	MK_SB15_0.1	MK_SB16_0.5	MK_SB09_0.1
				10-OCT-2013 15:00	10-OCT-2013 15:00	10-OCT-2013 15:00	10-OCT-2013 15:00	10-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322434-001	ES1322434-002	ES1322434-003	ES1322434-004	ES1322434-005
<b>EP075(SIM)A: Phenolic Compounds - Continued</b>								
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	----	<2	<2	<2	<2
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	----	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	----	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	----	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	----	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	----	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	----	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	----	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	----	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	----	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	----	<50	<50	<50	<50





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

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Client sampling date / time

				MD_MW01_0.5	MD_MW01_1.0	MK_SB15_0.1	MK_SB16_0.5	MK_SB09_0.1
				10-OCT-2013 15:00	10-OCT-2013 15:00	10-OCT-2013 15:00	10-OCT-2013 15:00	10-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322434-001	ES1322434-002	ES1322434-003	ES1322434-004	ES1322434-005
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 - Continued</b>								
>C16 - C34 Fraction	----	100	mg/kg	----	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	----	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	----	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	----	<50	<50	<50	<50
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	----	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	----	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	----	<1	<1	<1	<1
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	----	75.4	----	----	----
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	108	----	----	----
Toluene-D8	2037-26-5	0.1	%	----	121	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	----	116	----	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	----	105	104	97.1	100
2-Chlorophenol-D4	93951-73-6	0.1	%	----	113	105	97.3	101
2,4,6-Tribromophenol	118-79-6	0.1	%	----	89.1	112	103	104
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	----	98.2	104	96.2	98.0
Anthracene-d10	1719-06-8	0.1	%	----	88.6	96.0	87.4	94.6
4-Terphenyl-d14	1718-51-0	0.1	%	----	87.2	89.3	81.1	81.9
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	130	96.8	103	94.0
Toluene-D8	2037-26-5	0.1	%	----	113	107	114	106
4-Bromofluorobenzene	460-00-4	0.1	%	----	112	105	108	103



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB14_0.1	MK_SB14_1.0	MK_SB10_0.1	MK_SB10_1.2	D_111013_01_GP
				10-OCT-2013 15:00	10-OCT-2013 15:00	10-OCT-2013 15:00	11-OCT-2013 15:00	11-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322434-006	ES1322434-007	ES1322434-008	ES1322434-009	ES1322434-010
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	----	17.0	----	18.8	20.9
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	----	No	----	----
Asbestos Type	1332-21-4	0.1	--	-	----	-	----	----
Sample weight (dry)	----	0.01	g	559	----	294	----	----
APPROVED IDENTIFIER:	----	-	--	P.RENNIE	----	P.RENNIE	----	----
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	----	<5	----	<5	<5
Arsenic	7440-38-2	5	mg/kg	----	<5	----	<5	<5
Cadmium	7440-43-9	1	mg/kg	----	<1	----	<1	<1
Chromium	7440-47-3	2	mg/kg	----	6	----	4	5
Copper	7440-50-8	5	mg/kg	----	21	----	<5	5
Lead	7439-92-1	5	mg/kg	----	18	----	9	9
Nickel	7440-02-0	2	mg/kg	----	6	----	3	6
Zinc	7440-66-6	5	mg/kg	----	26	----	6	10
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	----	<0.1	----	<0.1	<0.1
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	----	<1	----	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	----	<2	----	<2	<2
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	----	<0.5	----	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB14_0.1	MK_SB14_1.0	MK_SB10_0.1	MK_SB10_1.2	D_111013_01_GP
				10-OCT-2013 15:00	10-OCT-2013 15:00	10-OCT-2013 15:00	11-OCT-2013 15:00	11-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322434-006	ES1322434-007	ES1322434-008	ES1322434-009	ES1322434-010
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Acenaphthene	83-32-9	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	----	<b>0.6</b>	----	<b>0.6</b>	<b>0.6</b>
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	----	<b>1.2</b>	----	<b>1.2</b>	<b>1.2</b>
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	----	<10	----	<10	<10
C10 - C14 Fraction	----	50	mg/kg	----	<50	----	<50	<50
C15 - C28 Fraction	----	100	mg/kg	----	<100	----	<100	<100
C29 - C36 Fraction	----	100	mg/kg	----	<100	----	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	----	<50	----	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	----	<10	----	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	----	<10	----	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	----	<50	----	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	----	<100	----	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	----	<100	----	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	----	<50	----	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	----	<50	----	<50	<50



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB14_0.1	MK_SB14_1.0	MK_SB10_0.1	MK_SB10_1.2	D_111013_01_GP
				10-OCT-2013 15:00	10-OCT-2013 15:00	10-OCT-2013 15:00	11-OCT-2013 15:00	11-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322434-006	ES1322434-007	ES1322434-008	ES1322434-009	ES1322434-010
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	----	<0.2	----	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	----	<0.2	----	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	----	<0.5	----	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	----	<1	----	<1	<1
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	----	96.5	----	96.5	95.6
2-Chlorophenol-D4	93951-73-6	0.1	%	----	102	----	99.1	99.4
2,4,6-Tribromophenol	118-79-6	0.1	%	----	93.0	----	98.4	100
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	----	91.0	----	98.1	98.7
Anthracene-d10	1719-06-8	0.1	%	----	82.5	----	92.4	91.8
4-Terphenyl-d14	1718-51-0	0.1	%	----	80.5	----	83.0	82.6
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	91.2	----	85.8	92.6
Toluene-D8	2037-26-5	0.1	%	----	106	----	98.0	107
4-Bromofluorobenzene	460-00-4	0.1	%	----	100	----	93.6	104



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MC_MW03_0.7	MC_MW03_1.0	MC_MW02_0.3	MC_MW02_1.1	----
				11-OCT-2013 15:00	11-OCT-2013 15:00	11-OCT-2013 15:00	11-OCT-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1322434-012	ES1322434-013	ES1322434-014	ES1322434-015	----
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	14.0	13.4	----	18.2	----
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	----	No	----	----
Asbestos Type	1332-21-4	0.1	--	-	----	-	----	----
Sample weight (dry)	----	0.01	g	718	----	711	----	----
APPROVED IDENTIFIER:	----	-	--	P.RENNIE	----	P.RENNIE	----	----
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	----	----	<5	----
Arsenic	7440-38-2	5	mg/kg	7	----	----	8	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	<1	----
Chromium	7440-47-3	2	mg/kg	4	----	----	7	----
Copper	7440-50-8	5	mg/kg	8	----	----	16	----
Lead	7439-92-1	5	mg/kg	18	----	----	17	----
Nickel	7440-02-0	2	mg/kg	18	----	----	28	----
Zinc	7440-66-6	5	mg/kg	44	----	----	56	----
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	<0.1	----
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	0.1	mg/kg	----	<0.1	----	----	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Benzene	71-43-2	0.2	mg/kg	----	<0.2	----	----	----
Toluene	108-88-3	0.5	mg/kg	----	<0.5	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	----	<0.5	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	<0.5	----	----	----
Styrene	100-42-5	0.5	mg/kg	----	<0.5	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	----	<0.5	----	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg	----	<0.5	----	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg	----	<0.5	----	----	----
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	----	<0.5	----	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	----	<0.5	----	----	----
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	----	<0.5	----	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	----	<0.5	----	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	----	<0.5	----	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MC_MW03_0.7	MC_MW03_1.0	MC_MW02_0.3	MC_MW02_1.1	----
				11-OCT-2013 15:00	11-OCT-2013 15:00	11-OCT-2013 15:00	11-OCT-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1322434-012	ES1322434-013	ES1322434-014	ES1322434-015	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons - Continued</b>								
n-Butylbenzene	104-51-8	0.5	mg/kg	----	<0.5	----	----	----
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	----	<5	----	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg	----	<5	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	----	<5	----	----	----
2-Hexanone (MBK)	591-78-6	5	mg/kg	----	<5	----	----	----
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	----	<0.5	----	----	----
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	----	<0.5	----	----	----
1,2-Dichloropropane	78-87-5	0.5	mg/kg	----	<0.5	----	----	----
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	----	<0.5	----	----	----
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	----	<0.5	----	----	----
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	----	<0.5	----	----	----
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	----	<5	----	----	----
Chloromethane	74-87-3	5	mg/kg	----	<5	----	----	----
Vinyl chloride	75-01-4	5	mg/kg	----	<5	----	----	----
Bromomethane	74-83-9	5	mg/kg	----	<5	----	----	----
Chloroethane	75-00-3	5	mg/kg	----	<5	----	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg	----	<5	----	----	----
1,1-Dichloroethene	75-35-4	0.5	mg/kg	----	<0.5	----	----	----
Iodomethane	74-88-4	0.5	mg/kg	----	<0.5	----	----	----
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	----	<0.5	----	----	----
1,1-Dichloroethane	75-34-3	0.5	mg/kg	----	<0.5	----	----	----
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	----	<0.5	----	----	----
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	----	<0.5	----	----	----
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	----	<0.5	----	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg	----	<0.5	----	----	----
1,2-Dichloroethane	107-06-2	0.5	mg/kg	----	<0.5	----	----	----
Trichloroethene	79-01-6	0.5	mg/kg	----	<0.5	----	----	----
Dibromomethane	74-95-3	0.5	mg/kg	----	<0.5	----	----	----
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	----	<0.5	----	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				MC_MW03_0.7	MC_MW03_1.0	MC_MW02_0.3	MC_MW02_1.1	----
				11-OCT-2013 15:00	11-OCT-2013 15:00	11-OCT-2013 15:00	11-OCT-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1322434-012	ES1322434-013	ES1322434-014	ES1322434-015	----
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
1,3-Dichloropropane	142-28-9	0.5	mg/kg	----	<0.5	----	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg	----	<0.5	----	----	----
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	----	<0.5	----	----	----
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	----	<0.5	----	----	----
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	----	<0.5	----	----	----
1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	----	<0.5	----	----	----
1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	----	<0.5	----	----	----
Pentachloroethane	76-01-7	0.5	mg/kg	----	<0.5	----	----	----
1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	----	<0.5	----	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg	----	<0.5	----	----	----
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	----	<0.5	----	----	----
Bromobenzene	108-86-1	0.5	mg/kg	----	<0.5	----	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg	----	<0.5	----	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg	----	<0.5	----	----	----
1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	----	<0.5	----	----	----
1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	----	<0.5	----	----	----
1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	----	<0.5	----	----	----
1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	----	<0.5	----	----	----
1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	----	<0.5	----	----	----
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	----	<0.5	----	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg	----	<0.5	----	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg	----	<0.5	----	----	----
Bromoform	75-25-2	0.5	mg/kg	----	<0.5	----	----	----
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	5	mg/kg	----	<5	----	----	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	----	----	<0.5	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	----	----	<0.5	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	----	----	<0.5	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	----	----	<1	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	----	----	<0.5	----





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MC_MW03_0.7	MC_MW03_1.0	MC_MW02_0.3	MC_MW02_1.1	----
				11-OCT-2013 15:00	11-OCT-2013 15:00	11-OCT-2013 15:00	11-OCT-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1322434-012	ES1322434-013	ES1322434-014	ES1322434-015	----
<b>EP075(SIM)A: Phenolic Compounds - Continued</b>								
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	----	----	<0.5	----
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	----	----	<0.5	----
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	----	----	<0.5	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	----	----	<0.5	----
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	----	----	<0.5	----
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	----	----	<0.5	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	----	----	<2	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	----	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	----	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	----	<0.5	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	----	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	----	<b>0.5</b>	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	----	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	----	<0.5	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	----	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	----	<0.5	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	----	<0.5	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	----	----	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	----	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	----	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	----	<0.5	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	----	<0.5	----
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	----	----	<0.5	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	----	----	<b>0.5</b>	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	----	----	<0.5	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	----	----	<b>0.6</b>	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	----	----	<b>1.2</b>	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	----	----	<10	----
C10 - C14 Fraction	----	50	mg/kg	<50	----	----	<50	----
C15 - C28 Fraction	----	100	mg/kg	<100	----	----	<100	----
C29 - C36 Fraction	----	100	mg/kg	<100	----	----	<100	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	<50	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MC_MW03_0.7	MC_MW03_1.0	MC_MW02_0.3	MC_MW02_1.1	----
				11-OCT-2013 15:00	11-OCT-2013 15:00	11-OCT-2013 15:00	11-OCT-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1322434-012	ES1322434-013	ES1322434-014	ES1322434-015	----
<b>EP080/071: Total Petroleum Hydrocarbons - Continued</b>								
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	----	<10	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	----	----	<10	----
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	----	----	<50	----
>C16 - C34 Fraction	----	100	mg/kg	<100	----	----	<100	----
>C34 - C40 Fraction	----	100	mg/kg	<100	----	----	<100	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	<50	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	----	----	<50	----
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	----	<0.2	----
Toluene	108-88-3	0.5	mg/kg	<0.5	----	----	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	----	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	----	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	----	<0.5	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	----	----	<0.2	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	----	----	<0.5	----
Naphthalene	91-20-3	1	mg/kg	<1	----	----	<1	----
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	----	70.7	----	----	----
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	99.8	----	----	----
Toluene-D8	2037-26-5	0.1	%	----	115	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	----	110	----	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	91.0	----	----	97.6	----
2-Chlorophenol-D4	93951-73-6	0.1	%	96.1	----	----	104	----
2,4,6-Tribromophenol	118-79-6	0.1	%	94.1	----	----	104	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	97.4	----	----	103	----
Anthracene-d10	1719-06-8	0.1	%	89.6	----	----	95.6	----
4-Terphenyl-d14	1718-51-0	0.1	%	79.9	----	----	84.4	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

MC_MW03_0.7	MC_MW03_1.0	MC_MW02_0.3	MC_MW02_1.1	----
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Client sampling date / time

11-OCT-2013 15:00	11-OCT-2013 15:00	11-OCT-2013 15:00	11-OCT-2013 15:00	----
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Compound	CAS Number	LOR	Unit	ES1322434-012	ES1322434-013	ES1322434-014	ES1322434-015	----
----------	------------	-----	------	---------------	---------------	---------------	---------------	------

### EP080S: TPH(V)/BTEX Surrogates

1,2-Dichloroethane-D4	17060-07-0	0.1	%	97.6	----	----	98.1	----
Toluene-D8	2037-26-5	0.1	%	107	----	----	109	----
4-Bromofluorobenzene	460-00-4	0.1	%	106	----	----	105	----

## Analytical Results

### Descriptive Results

Sub-Matrix: SOIL

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
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### EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples

EA200: Description	MD_MW01_0.5 - 10-OCT-2013 15:00	Brown soil with large quantity vegetation
EA200: Description	MK_SB15_0.1 - 10-OCT-2013 15:00	Grey-brown soil with some vegetation and small white rocks and coal pieces
EA200: Description	MK_SB16_0.5 - 10-OCT-2013 15:00	Grey-brown soil with some vegetation and small white rocks and coal pieces
EA200: Description	MK_SB09_0.1 - 10-OCT-2013 15:00	Brown soil with large quantity vegetation
EA200: Description	MK_SB14_0.1 - 10-OCT-2013 15:00	Brown soil with large quantity vegetation
EA200: Description	MK_SB10_0.1 - 10-OCT-2013 15:00	Brown soil with large quantity vegetation
EA200: Description	MC_MW03_0.7 - 11-OCT-2013 15:00	Grey-brown soil with some vegetation and small to medium sized grey-brown rocks and small coal pieces
EA200: Description	MC_MW02_0.3 - 11-OCT-2013 15:00	Grey-brown soil with some vegetation and small to medium sized grey-brown rocks and small coal pieces



## Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP066S: PCB Surrogate</b>			
Decachlorobiphenyl	2051-24-3	39	149
<b>EP074S: VOC Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	64	130
Toluene-D8	2037-26-5	66	136
4-Bromofluorobenzene	460-00-4	60	122
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

## QUALITY CONTROL REPORT

<b>Work Order</b>	: <b>ES1322434</b>	Page	: 1 of 24
<b>Amendment</b>	: <b>2</b>		
<b>Client</b>	: <b>ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: MR JONATHAN LEKAWSKI	<b>Contact</b>	: Barbara Hanna
<b>Address</b>	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: jonathan.lekawski@erm.com	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: PROJECT SYMPHONY - MP	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b>	: ----		
<b>C-O-C number</b>	: ----	<b>Date Samples Received</b>	: 16-OCT-2013
<b>Sampler</b>	: T.SHAW/G.POWELL	<b>Issue Date</b>	: 14-JAN-2014
<b>Order number</b>	: ----		
<b>Quote number</b>	: SY/278/13 V3	<b>No. of samples received</b>	: 23
		<b>No. of samples analysed</b>	: 14

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Peter Rennie	Asbestos Identifier	Newcastle - Asbestos



### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :  
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
RPD = Relative Percentage Difference  
# = Indicates failed QC



## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EA055: Moisture Content (QC Lot: 3114016)</b>									
ES1322331-003	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	<1.0	<1.0	0.0	No Limit
ES1322434-015	MC_MW02_1.1	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	18.2	18.8	3.5	0% - 50%
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3113872)</b>									
ES1322434-002	MD_MW01_1.0	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	8	9	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	9	9	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	6	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	13	14	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	15	15	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	35	37	4.8	No Limit
ES1322434-007	MK_SB14_1.0	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	6	10	41.2	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	6	8	17.4	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	7	32.4	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	21	19	9.8	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	18	22	16.4	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	26	29	8.4	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3113873)</b>									
ES1322434-002	MD_MW01_1.0	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1322434-007	MK_SB14_1.0	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 3109542)</b>									
ES1322403-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3110670)</b>									
ES1322364-001	Anonymous	EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1322437-004	Anonymous	EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit





Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3110670) - continued</b>										
ES1322437-004	Anonymous	EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3111259)</b>										
ES1322437-016	Anonymous	EP074: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP074: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			106-42-3							
		EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
ES1322437-021	Anonymous	EP074: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP074: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			106-42-3							
		EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
<b>EP074B: Oxygenated Compounds (QC Lot: 3110670)</b>										



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074B: Oxygenated Compounds (QC Lot: 3110670) - continued</b>									
ES1322364-001	Anonymous	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.0	No Limit
ES1322437-004	Anonymous	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.0	No Limit
<b>EP074B: Oxygenated Compounds (QC Lot: 3111259)</b>									
ES1322437-016	Anonymous	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.0	No Limit
ES1322437-021	Anonymous	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.0	No Limit
<b>EP074C: Sulfonated Compounds (QC Lot: 3110670)</b>									
ES1322364-001	Anonymous	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1322437-004	Anonymous	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074C: Sulfonated Compounds (QC Lot: 3111259)</b>									
ES1322437-016	Anonymous	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1322437-021	Anonymous	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074D: Fumigants (QC Lot: 3110670)</b>									
ES1322364-001	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1322437-004	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074D: Fumigants (QC Lot: 3111259)</b>									
ES1322437-016	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074D: Fumigants (QC Lot: 3111259) - continued</b>									
ES1322437-016	Anonymous	EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1322437-021	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3110670)</b>									
ES1322364-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	0.6	<0.5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	0.5	<0.5	0.0	No Limit
		EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.0	No Limit
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.0	No Limit		
ES1322437-004	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3110670) - continued</b>									
ES1322437-004	Anonymous	EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.0	No Limit
EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.0	No Limit		
EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.0	No Limit		
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.0	No Limit		
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3111259)</b>									
ES1322437-016	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3111259) - continued</b>									
ES1322437-016	Anonymous	EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.0	No Limit
ES1322437-021	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3110670)</b>									
ES1322364-001	Anonymous	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1322437-004	Anonymous	EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1322437-016	Anonymous	EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1322437-021	Anonymous	EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074G: Trihalomethanes (QC Lot: 3110670)</b>									
ES1322364-001	Anonymous	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074G: Trihalomethanes (QC Lot: 3110670) - continued</b>									
ES1322364-001	Anonymous	EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1322437-004	Anonymous	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074G: Trihalomethanes (QC Lot: 3111259)</b>									
ES1322437-016	Anonymous	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1322437-021	Anonymous	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074H: Naphthalene (QC Lot: 3110670)</b>									
ES1322364-001	Anonymous	EP074: Naphthalene	91-20-3	5	mg/kg	<5	<5	0.0	No Limit
ES1322437-004	Anonymous	EP074: Naphthalene	91-20-3	5	mg/kg	<5	<5	0.0	No Limit
<b>EP074H: Naphthalene (QC Lot: 3111259)</b>									
ES1322437-016	Anonymous	EP074: Naphthalene	91-20-3	5	mg/kg	<5	<5	0.0	No Limit
ES1322437-021	Anonymous	EP074: Naphthalene	91-20-3	5	mg/kg	<5	<5	0.0	No Limit
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3109562)</b>									
ES1322434-002	MD_MW01_1.0	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
ES1322434-012	MC_MW03_0.7	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit





Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3109562) - continued</b>									
ES1322434-012	MC_MW03_0.7	EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3109562)</b>									
ES1322434-002	MD_MW01_1.0	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1322434-012	MC_MW03_0.7	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3109562) - continued</b>										
ES1322434-012	MC_MW03_0.7	EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3109561)</b>										
ES1322434-002	MD_MW01_1.0	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit	
ES1322434-012	MC_MW03_0.7	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3110669)</b>										
ES1322364-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit	
ES1322437-004	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3111189)</b>										
ES1322433-002	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit	
ES1322434-010	D_111013_01_GP	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3109561)</b>										
ES1322434-002	MD_MW01_1.0	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit	
ES1322434-012	MC_MW03_0.7	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3110669)</b>										
ES1322364-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit	
ES1322437-004	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3111189)</b>										
ES1322433-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit	
ES1322434-010	D_111013_01_GP	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit	
<b>EP080: BTEXN (QC Lot: 3110669)</b>										
ES1322364-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit		



Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP080: BTEXN (QC Lot: 3110669) - continued</b>									
ES1322437-004	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3111189)</b>									
ES1322433-002	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES1322434-010	D_111013_01_GP	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit



## Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3113872)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	112	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	105	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	107	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	122	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	110	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	115	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	93.3	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	108	81	133	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3113873)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	101	66	112	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3109542)</b>									
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	81.8	57.4	117	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3110670)</b>									
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	97.7	64	126	
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	95.7	66	128	
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	87.2	63	129	
EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	87.2	63	129	
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	88.4	64	130	
EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	88.4	63	129	
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	88.4	63	129	
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	87.6	62	130	
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	85.1	61	131	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3111259)</b>									
EP074: Benzene	71-43-2	0.5	mg/kg	<0.5	1 mg/kg	81.6	64	118	
EP074: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	82.6	65	133	
EP074: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	83.0	65	127	
EP074: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	83.6	69	127	
	106-42-3								
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	81.8	64	126	
EP074: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	86.6	65	119	
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	85.2	66	128	
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	82.8	63	129	
EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	82.7	63	129	
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	83.1	64	130	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3111259) - continued</b>									
EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	82.0	63	129	
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	82.2	63	129	
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	82.1	62	130	
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	82.0	61	131	
<b>EP074B: Oxygenated Compounds (QCLot: 3110670)</b>									
EP074: Vinyl Acetate	108-05-4	1	mg/kg	----	10 mg/kg	45.6	29.6	156	
		5	mg/kg	<5	----	----	----	----	
EP074: 2-Butanone (MEK)	78-93-3	1	mg/kg	----	10 mg/kg	118	58	136	
		5	mg/kg	<5	----	----	----	----	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	1	mg/kg	----	10 mg/kg	89.5	54	138	
		5	mg/kg	<5	----	----	----	----	
EP074: 2-Hexanone (MBK)	591-78-6	1	mg/kg	----	10 mg/kg	94.4	54	136	
		5	mg/kg	<5	----	----	----	----	
<b>EP074B: Oxygenated Compounds (QCLot: 3111259)</b>									
EP074: Vinyl Acetate	108-05-4	1	mg/kg	----	10 mg/kg	# 29.2	29.6	156	
		5	mg/kg	<5	----	----	----	----	
EP074: 2-Butanone (MEK)	78-93-3	1	mg/kg	----	10 mg/kg	96.4	58	136	
		5	mg/kg	<5	----	----	----	----	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	1	mg/kg	----	10 mg/kg	71.8	54	138	
		5	mg/kg	<5	----	----	----	----	
EP074: 2-Hexanone (MBK)	591-78-6	1	mg/kg	----	10 mg/kg	82.0	54	136	
		5	mg/kg	<5	----	----	----	----	
<b>EP074C: Sulfonated Compounds (QCLot: 3110670)</b>									
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	55.3	54	126	
<b>EP074C: Sulfonated Compounds (QCLot: 3111259)</b>									
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	81.6	54	126	
<b>EP074D: Fumigants (QCLot: 3110670)</b>									
EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	84.9	55	133	
EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	94.4	69	127	
EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	92.4	54	124	
EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	83.5	51	125	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	100	66	126	
<b>EP074D: Fumigants (QCLot: 3111259)</b>									
EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	79.2	55	133	
EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	85.5	69	127	
EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	62.6	54	124	
EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	61.2	51	125	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	78.4	66	126	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3110670)</b>									
EP074: Dichlorodifluoromethane	75-71-8	1	mg/kg	----	10 mg/kg	39.6	30	148	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloromethane	74-87-3	1	mg/kg	----	10 mg/kg	56.7	41	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Vinyl chloride	75-01-4	1	mg/kg	----	10 mg/kg	83.6	43	147	
		5	mg/kg	<5	----	----	----	----	
EP074: Bromomethane	74-83-9	1	mg/kg	----	10 mg/kg	68.0	47	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloroethane	75-00-3	1	mg/kg	----	10 mg/kg	74.8	49	143	
		5	mg/kg	<5	----	----	----	----	
EP074: Trichlorofluoromethane	75-69-4	1	mg/kg	----	10 mg/kg	78.7	49	135	
		5	mg/kg	<5	----	----	----	----	
EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	79.4	54	126	
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	62.8	43	129	
EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	90.2	62	130	
EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	91.5	66	132	
EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	93.2	66	132	
EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	79.1	62	126	
EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	90.8	64	128	
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	74.5	59	125	
EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	87.0	65	123	
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	92.8	64	120	
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	94.1	65	127	
EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	108	70	130	
EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	106	72	128	
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	94.5	67	143	
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	82.8	62	122	
EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	93.3	54	128	
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	95.3	55	129	
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	93.6	56	132	
EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	97.6	65	135	
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	76.4	19.8	134	
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	72.2	53	129	
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	84.2	48	136	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3111259)</b>									
EP074: Dichlorodifluoromethane	75-71-8	1	mg/kg	----	10 mg/kg	46.8	30	148	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloromethane	74-87-3	1	mg/kg	----	10 mg/kg	64.3	41	141	
		5	mg/kg	<5	----	----	----	----	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3111259) - continued</b>									
EP074: Vinyl chloride	75-01-4	1	mg/kg	----	10 mg/kg	90.2	43	147	
		5	mg/kg	<5	----	----	----	----	
EP074: Bromomethane	74-83-9	1	mg/kg	----	10 mg/kg	75.7	47	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloroethane	75-00-3	1	mg/kg	----	10 mg/kg	84.2	49	143	
		5	mg/kg	<5	----	----	----	----	
EP074: Trichlorofluoromethane	75-69-4	1	mg/kg	----	10 mg/kg	83.2	49	135	
		5	mg/kg	<5	----	----	----	----	
EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	84.6	54	126	
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	59.4	43	129	
EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	81.8	62	130	
EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	84.0	66	132	
EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	83.9	66	132	
EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	75.7	62	126	
EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	88.5	64	128	
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	79.6	59	125	
EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	83.8	65	123	
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	81.6	64	120	
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	82.3	65	127	
EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	83.1	70	130	
EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	82.7	72	128	
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	90.3	67	143	
EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	67.6	62	122	
EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	74.9	54	128	
EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	76.3	55	129	
EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	80.4	56	132	
EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	83.9	65	135	
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	73.4	19.8	134	
EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	74.4	53	129	
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	80.3	48	136	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3110670)</b>									
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	95.9	70	128	
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	86.9	67	127	
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	86.4	64	130	
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	85.8	62	130	
EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	89.0	63	129	
EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	90.4	63	129	
EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	89.7	66	128	
EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	81.3	54	134	





Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3110670) - continued</b>									
EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	89.0	60	132	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3111259)</b>									
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	84.7	70	128	
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	81.4	67	127	
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	81.6	64	130	
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	82.1	62	130	
EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	83.0	63	129	
EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	81.7	63	129	
EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	80.1	66	128	
EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	77.8	54	134	
EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	81.3	60	132	
<b>EP074G: Trihalomethanes (QCLot: 3110670)</b>									
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	89.6	62	120	
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	78.8	61	121	
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	84.6	63	121	
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	73.6	60	126	
<b>EP074G: Trihalomethanes (QCLot: 3111259)</b>									
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	81.0	62	120	
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	78.0	61	121	
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	72.7	63	121	
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	75.3	60	126	
<b>EP074H: Naphthalene (QCLot: 3110670)</b>									
EP074: Naphthalene	91-20-3	0.5	mg/kg	----	1 mg/kg	97.7	63	133	
		5	mg/kg	<5	----	----	----	----	
<b>EP074H: Naphthalene (QCLot: 3111259)</b>									
EP074: Naphthalene	91-20-3	0.5	mg/kg	----	1 mg/kg	81.1	63	133	
		5	mg/kg	<5	----	----	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3109562)</b>									
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	88.9	74	116	
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	98.3	74	116	
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	95.0	72	116	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	86.3	69	123	
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	85.0	60.3	117	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	89.4	69	117	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	82.8	68	112	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	86.9	73	117	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	80.6	76.4	114	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	92.2	57	111	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3109562) - continued</b>									
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	85.1	68.9	112	
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	31.7	3.9	57	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3109562)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	105	80	124	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	105	77	123	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	108	79	123	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	106	77	123	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	110	79	123	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	107	79	123	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	110	79	123	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	113	79	125	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	85.2	73	121	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	105	81	123	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	84.6	70	118	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	105	77	123	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	103	76	122	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	104	71	113	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	94.1	71.7	113	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	99.9	72.4	114	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3109561)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	97.8	71	131	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	101	74	138	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	89.4	64	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3110669)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	106	68.4	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3111189)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	100	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3109561)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	98.2	70	130	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	98.2	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	
		50	mg/kg	----	150 mg/kg	71.8	63	131	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3110669)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	107	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3111189)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	98.4	68.4	128	
<b>EP080: BTEXN (QCLot: 3110669)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	90.8	62	116	



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit		Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High
<b>EP080: BTEXN (QCLot: 3110669) - continued</b>								
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	94.2	62	128
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	91.6	58	118
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	95.6	60	120
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	93.2	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	86.5	62	138
<b>EP080: BTEXN (QCLot: 3111189)</b>								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	91.8	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	93.5	62	128
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	91.0	58	118
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	94.0	60	120
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	91.0	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	86.6	62	138

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%) Low High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3113872)</b>							
ES1322434-002	MD_MW01_1.0	EG005T: Arsenic	7440-38-2	50 mg/kg	99.0	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	95.9	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	99.5	70	130
		EG005T: Copper	7440-50-8	125 mg/kg	110	70	130
		EG005T: Lead	7439-92-1	125 mg/kg	96.5	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	100	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	100	70	130
		EG005T: Zinc	7440-66-6	125 mg/kg	92.5	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3113873)</b>							
ES1322434-002	MD_MW01_1.0	EG035T: Mercury	7439-97-6	5 mg/kg	116	70	130
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3109542)</b>							
ES1322403-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	110	70	130
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3111259)</b>							
ES1322437-016	Anonymous	EP074: Benzene	71-43-2	2.5 mg/kg	99.3	70	130
		EP074: Toluene	108-88-3	2.5 mg/kg	109	70	130



Sub-Matrix: SOIL

				Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3110670)</b>							
ES1322364-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	5 mg/kg	95.0	70	130
		EP074: Trichloroethene	79-01-6	5 mg/kg	85.2	70	130
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3111259)</b>							
ES1322437-016	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	99.3	70	130
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	101	70	130
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3110670)</b>							
ES1322364-001	Anonymous	EP074: Chlorobenzene	108-90-7	5 mg/kg	100	70	130
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3111259)</b>							
ES1322437-016	Anonymous	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	109	70	130
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3109562)</b>							
ES1322434-002	MD_MW01_1.0	EP075(SIM): Phenol	108-95-2	10 mg/kg	73.3	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	82.3	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	75.2	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	75.8	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	67.4	20	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3109562)</b>							
ES1322434-002	MD_MW01_1.0	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	85.4	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	86.8	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3109561)</b>							
ES1322434-002	MD_MW01_1.0	EP071: C10 - C14 Fraction	----	640 mg/kg	75.0	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	76.4	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	66.2	52	132
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3110669)</b>							
ES1322364-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	81.3	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3111189)</b>							
ES1322433-002	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	89.6	70	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3109561)</b>							
ES1322434-002	MD_MW01_1.0	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	94.8	73	137
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	70.4	53	131
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	53.4	52	132
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3110669)</b>							
ES1322364-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	81.4	70	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3111189)</b>							
ES1322433-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	86.2	70	130
<b>EP080: BTEXN (QCLot: 3110669)</b>							



Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report				
				Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EP080: BTEXN (QCLot: 3110669) - continued</b>								
ES1322364-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	74.4	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	70.6	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	73.3	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	71.2	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	73.4	70	130	
	EP080: Naphthalene	91-20-3	2.5 mg/kg	70.5	70	130		
<b>EP080: BTEXN (QCLot: 3111189)</b>								
ES1322433-002	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	78.5	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	83.5	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	85.2	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	85.1	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	85.6	70	130	
	EP080: Naphthalene	91-20-3	2.5 mg/kg	77.4	70	130		

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3109542)</b>										
ES1322403-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	110	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3109561)</b>										
ES1322434-002	MD_MW01_1.0	EP071: C10 - C14 Fraction	----	640 mg/kg	75.0	----	73	137	----	----
		EP071: C15 - C28 Fraction	----	3140 mg/kg	76.4	----	53	131	----	----
		EP071: C29 - C36 Fraction	----	2860 mg/kg	66.2	----	52	132	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3109561)</b>										
ES1322434-002	MD_MW01_1.0	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	94.8	----	73	137	----	----
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	70.4	----	53	131	----	----
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	53.4	----	52	132	----	----
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3109562)</b>										
ES1322434-002	MD_MW01_1.0	EP075(SIM): Phenol	108-95-2	10 mg/kg	73.3	----	70	130	----	----
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	82.3	----	70	130	----	----
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	75.2	----	60	130	----	----
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	75.8	----	70	130	----	----



Sub-Matrix: SOIL

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
					MS	MSD	Low	High	Value	Control Limit	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3109562) - continued</b>											
ES1322434-002	MD_MW01_1.0	EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	67.4	----	20	130	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3109562)</b>											
ES1322434-002	MD_MW01_1.0	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	85.4	----	70	130	----	----	
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	86.8	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3110669)</b>											
ES1322364-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	81.3	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3110669)</b>											
ES1322364-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	81.4	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3110669)</b>											
ES1322364-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	74.4	----	70	130	----	----	
		EP080: Toluene	108-88-3	2.5 mg/kg	70.6	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	73.3	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	71.2	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	73.4	----	70	130	----	----	
		EP080: Naphthalene	91-20-3	2.5 mg/kg	70.5	----	70	130	----	----	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3110670)</b>											
ES1322364-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	5 mg/kg	95.0	----	70	130	----	----	
		EP074: Trichloroethene	79-01-6	5 mg/kg	85.2	----	70	130	----	----	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3110670)</b>											
ES1322364-001	Anonymous	EP074: Chlorobenzene	108-90-7	5 mg/kg	100	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3111189)</b>											
ES1322433-002	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	89.6	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3111189)</b>											
ES1322433-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	86.2	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3111189)</b>											
ES1322433-002	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	78.5	----	70	130	----	----	
		EP080: Toluene	108-88-3	2.5 mg/kg	83.5	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	85.2	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	85.1	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	85.6	----	70	130	----	----	
		EP080: Naphthalene	91-20-3	2.5 mg/kg	77.4	----	70	130	----	----	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3111259)</b>											
ES1322437-016	Anonymous	EP074: Benzene	71-43-2	2.5 mg/kg	99.3	----	70	130	----	----	
		EP074: Toluene	108-88-3	2.5 mg/kg	109	----	70	130	----	----	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3111259)</b>											



Sub-Matrix: SOIL

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3111259) - continued</b>										
ES1322437-016	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	99.3	----	70	130	----	----
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	101	----	70	130	----	----
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3111259)</b>										
ES1322437-016	Anonymous	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	109	----	70	130	----	----
<b>EG005T: Total Metals by ICP-AES (QCLot: 3113872)</b>										
ES1322434-002	MD_MW01_1.0	EG005T: Arsenic	7440-38-2	50 mg/kg	99.0	----	70	130	----	----
		EG005T: Cadmium	7440-43-9	50 mg/kg	95.9	----	70	130	----	----
		EG005T: Chromium	7440-47-3	50 mg/kg	99.5	----	70	130	----	----
		EG005T: Copper	7440-50-8	125 mg/kg	110	----	70	130	----	----
		EG005T: Lead	7439-92-1	125 mg/kg	96.5	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	100	----	70	130	----	----
		EG005T: Selenium	7782-49-2	50 mg/kg	100	----	70	130	----	----
		EG005T: Zinc	7440-66-6	125 mg/kg	92.5	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3113873)</b>										
ES1322434-002	MD_MW01_1.0	EG035T: Mercury	7439-97-6	5 mg/kg	116	----	70	130	----	----



## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1322434</b>	Page	: 1 of 8
Amendment	: <b>2</b>		
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: PROJECT SYMPHONY - MP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 16-OCT-2013
Sampler	: T.SHAW/G.POWELL	Issue Date	: 14-JAN-2014
Order number	: ----		
Quote number	: SY/278/13 V3	No. of samples received	: 23
		No. of samples analysed	: 14

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EA055: Moisture Content</b>								
<b>Soil Glass Jar - Unpreserved (EA055-103)</b> MD_MW01_1.0, MK_SB16_0.5, MK_SB14_1.0	MK_SB15_0.1, MK_SB09_0.1,	10-OCT-2013	----	----	----	18-OCT-2013	24-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EA055-103)</b> MK_SB10_1.2, MC_MW03_0.7, MC_MW02_1.1	D_111013_01_GP, MC_MW03_1.0,	11-OCT-2013	----	----	----	18-OCT-2013	25-OCT-2013	✓
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
<b>Snap Lock Bag (EA200)</b> MD_MW01_0.5, MK_SB16_0.5, MK_SB14_0.1,	MK_SB15_0.1, MK_SB09_0.1, MK_SB10_0.1	10-OCT-2013	---	08-APR-2014	----	23-OCT-2013	21-APR-2014	✓
<b>Snap Lock Bag (EA200)</b> MC_MW03_0.7,	MC_MW02_0.3	11-OCT-2013	---	09-APR-2014	----	23-OCT-2013	21-APR-2014	✓
<b>EG005T: Total Metals by ICP-AES</b>								
<b>Soil Glass Jar - Unpreserved (EG005T)</b> MD_MW01_1.0, MK_SB16_0.5, MK_SB14_1.0	MK_SB15_0.1, MK_SB09_0.1,	10-OCT-2013	18-OCT-2013	08-APR-2014	✓	19-OCT-2013	08-APR-2014	✓
<b>Soil Glass Jar - Unpreserved (EG005T)</b> MK_SB10_1.2, MC_MW03_0.7,	D_111013_01_GP, MC_MW02_1.1	11-OCT-2013	18-OCT-2013	09-APR-2014	✓	19-OCT-2013	09-APR-2014	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
<b>Soil Glass Jar - Unpreserved (EG035T)</b> MD_MW01_1.0, MK_SB16_0.5, MK_SB14_1.0	MK_SB15_0.1, MK_SB09_0.1,	10-OCT-2013	18-OCT-2013	07-NOV-2013	✓	21-OCT-2013	07-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EG035T)</b> MK_SB10_1.2, MC_MW03_0.7,	D_111013_01_GP, MC_MW02_1.1	11-OCT-2013	18-OCT-2013	08-NOV-2013	✓	21-OCT-2013	08-NOV-2013	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Soil Glass Jar - Unpreserved (EP066) MD_MW01_1.0	10-OCT-2013	17-OCT-2013	24-OCT-2013	✓	18-OCT-2013	26-NOV-2013	✓	
Soil Glass Jar - Unpreserved (EP066) MC_MW03_1.0	11-OCT-2013	17-OCT-2013	25-OCT-2013	✓	18-OCT-2013	26-NOV-2013	✓	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
Soil Glass Jar - Unpreserved (EP071) MD_MW01_1.0, MK_SB16_0.5, MK_SB14_1.0	MK_SB15_0.1, MK_SB09_0.1	10-OCT-2013	17-OCT-2013	24-OCT-2013	✓	18-OCT-2013	26-NOV-2013	✓
Soil Glass Jar - Unpreserved (EP071) MK_SB10_1.2, MC_MW03_0.7,	D_111013_01_GP, MC_MW02_1.1	11-OCT-2013	17-OCT-2013	25-OCT-2013	✓	18-OCT-2013	26-NOV-2013	✓
<b>EP074D: Fumigants</b>								
Soil Glass Jar - Unpreserved (EP074) MD_MW01_1.0		10-OCT-2013	17-OCT-2013	17-OCT-2013	✓	17-OCT-2013	17-OCT-2013	✓
Soil Glass Jar - Unpreserved (EP074) MC_MW03_1.0		11-OCT-2013	17-OCT-2013	18-OCT-2013	✓	17-OCT-2013	18-OCT-2013	✓
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Soil Glass Jar - Unpreserved (EP074) MD_MW01_1.0		10-OCT-2013	17-OCT-2013	17-OCT-2013	✓	17-OCT-2013	17-OCT-2013	✓
Soil Glass Jar - Unpreserved (EP074) MC_MW03_1.0		11-OCT-2013	17-OCT-2013	18-OCT-2013	✓	17-OCT-2013	18-OCT-2013	✓
<b>EP074F: Halogenated Aromatic Compounds</b>								
Soil Glass Jar - Unpreserved (EP074) MD_MW01_1.0		10-OCT-2013	17-OCT-2013	17-OCT-2013	✓	17-OCT-2013	17-OCT-2013	✓
Soil Glass Jar - Unpreserved (EP074) MC_MW03_1.0		11-OCT-2013	17-OCT-2013	18-OCT-2013	✓	17-OCT-2013	18-OCT-2013	✓
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Soil Glass Jar - Unpreserved (EP074) MD_MW01_1.0		10-OCT-2013	17-OCT-2013	17-OCT-2013	✓	17-OCT-2013	17-OCT-2013	✓
Soil Glass Jar - Unpreserved (EP074) MC_MW03_1.0		11-OCT-2013	17-OCT-2013	18-OCT-2013	✓	17-OCT-2013	18-OCT-2013	✓
<b>EP074H: Naphthalene</b>								
Soil Glass Jar - Unpreserved (EP074) MD_MW01_1.0		10-OCT-2013	17-OCT-2013	17-OCT-2013	✓	17-OCT-2013	17-OCT-2013	✓
Soil Glass Jar - Unpreserved (EP074) MC_MW03_1.0		11-OCT-2013	17-OCT-2013	18-OCT-2013	✓	17-OCT-2013	18-OCT-2013	✓
<b>EP074B: Oxygenated Compounds</b>								
Soil Glass Jar - Unpreserved (EP074) MD_MW01_1.0		10-OCT-2013	17-OCT-2013	17-OCT-2013	✓	17-OCT-2013	17-OCT-2013	✓
Soil Glass Jar - Unpreserved (EP074) MC_MW03_1.0		11-OCT-2013	17-OCT-2013	18-OCT-2013	✓	17-OCT-2013	18-OCT-2013	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP074C: Sulfonated Compounds</b>							
Soil Glass Jar - Unpreserved (EP074) MD_MW01_1.0	10-OCT-2013	17-OCT-2013	17-OCT-2013	✓	17-OCT-2013	17-OCT-2013	✓
Soil Glass Jar - Unpreserved (EP074) MC_MW03_1.0	11-OCT-2013	17-OCT-2013	18-OCT-2013	✓	17-OCT-2013	18-OCT-2013	✓
<b>EP074G: Trihalomethanes</b>							
Soil Glass Jar - Unpreserved (EP074) MD_MW01_1.0	10-OCT-2013	17-OCT-2013	17-OCT-2013	✓	17-OCT-2013	17-OCT-2013	✓
Soil Glass Jar - Unpreserved (EP074) MC_MW03_1.0	11-OCT-2013	17-OCT-2013	18-OCT-2013	✓	17-OCT-2013	18-OCT-2013	✓
<b>EP075(SIM)A: Phenolic Compounds</b>							
Soil Glass Jar - Unpreserved (EP075(SIM)) MD_MW01_1.0, MK_SB15_0.1, MK_SB16_0.5, MK_SB09_0.1, MK_SB14_1.0	10-OCT-2013	17-OCT-2013	24-OCT-2013	✓	18-OCT-2013	26-NOV-2013	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) MK_SB10_1.2, D_111013_01_GP, MC_MW03_0.7, MC_MW02_1.1	11-OCT-2013	17-OCT-2013	25-OCT-2013	✓	18-OCT-2013	26-NOV-2013	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>							
Soil Glass Jar - Unpreserved (EP075(SIM)) MD_MW01_1.0, MK_SB15_0.1, MK_SB16_0.5, MK_SB09_0.1, MK_SB14_1.0	10-OCT-2013	17-OCT-2013	24-OCT-2013	✓	18-OCT-2013	26-NOV-2013	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) MK_SB10_1.2, D_111013_01_GP, MC_MW03_0.7, MC_MW02_1.1	11-OCT-2013	17-OCT-2013	25-OCT-2013	✓	18-OCT-2013	26-NOV-2013	✓
<b>EP080: BTEXN</b>							
Soil Glass Jar - Unpreserved (EP080) MD_MW01_1.0, MK_SB15_0.1, MK_SB16_0.5, MK_SB09_0.1, MK_SB14_1.0	10-OCT-2013	17-OCT-2013	24-OCT-2013	✓	17-OCT-2013	24-OCT-2013	✓
Soil Glass Jar - Unpreserved (EP080) MK_SB10_1.2, D_111013_01_GP, MC_MW03_0.7, MC_MW02_1.1	11-OCT-2013	17-OCT-2013	25-OCT-2013	✓	17-OCT-2013	25-OCT-2013	✓
<b>EP080/071: Total Petroleum Hydrocarbons</b>							
Soil Glass Jar - Unpreserved (EP080) MD_MW01_1.0, MK_SB15_0.1, MK_SB16_0.5, MK_SB09_0.1, MK_SB14_1.0	10-OCT-2013	17-OCT-2013	24-OCT-2013	✓	17-OCT-2013	24-OCT-2013	✓
Soil Glass Jar - Unpreserved (EP080) MK_SB10_1.2, D_111013_01_GP, MC_MW03_0.7, MC_MW02_1.1	11-OCT-2013	17-OCT-2013	25-OCT-2013	✓	17-OCT-2013	25-OCT-2013	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Moisture Content	EA055-103	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	17	11.8	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	4	25.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	14	14.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	13	15.4	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	17	11.8	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	4	33	12.1	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	4	31	12.9	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	4	25.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	14	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	13	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	33	6.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	31	6.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	4	25.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	14	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	13	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	33	6.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	31	6.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	4	25.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	14	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	13	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	33	6.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	31	6.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Asbestos Identification in bulk solids	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (2013) Schedule B(3) (Method 506.1)
Volatile Organic Compounds	EP074	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option A - Concentrating)	ORG17A	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

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Work Order : ES1322434 Amendment 2  
Client : ENVIRO RESOURCES MANAGEMENT  
Project : PROJECT SYMPHONY - MP



<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.





## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Laboratory Control Spike (LCS) Recoveries</b>							
EP074B: Oxygenated Compounds	3710242-002	----	Vinyl Acetate	108-05-4	29.2 %	29.6-156%	Recovery less than lower control limit

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Matrix Spike outliers occur.

#### Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- No Analysis Holding Time Outliers exist.

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.

## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>ES1322435</b> <b>Amendment</b> : <b>1</b> <b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : <b>MR JONATHAN LEKAWSKI</b> <b>Address</b> : <b>GROUND FLOOR</b> <b>33 SAUNDERS STREET, PYRMONT NSW 2009</b> <b>LOCKED BAG 24</b> <b>BROADWAY NSW, AUSTRALIA 2007</b>  <b>E-mail</b> : <b>jonathan.lekawski@erm.com</b> <b>Telephone</b> : <b>+61 02 8584 8888</b> <b>Facsimile</b> : <b>+61 02 8584 8800</b> <b>Project</b> : <b>RPROJECT SYMPHONY - MP</b> <b>Order number</b> : <b>0207423</b> <b>C-O-C number</b> : <b>----</b> <b>Sampler</b> : <b>A.A</b> <b>Site</b> : <b>----</b>  <b>Quote number</b> : <b>SY/278/13 V3</b>	<b>Page</b> : 1 of 7  <b>Laboratory</b> : Environmental Division Sydney <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164  <b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555 <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement  <b>Date Samples Received</b> : 16-OCT-2013 <b>Issue Date</b> : 29-OCT-2013  <b>No. of samples received</b> : 8 <b>No. of samples analysed</b> : 8
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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Christopher Owler	Team Leader - Asbestos	Newcastle - Asbestos
Pabi Subba	Senior Organic Chemist	Sydney Organics



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EA200 Legend**
- **EA200 'Am' Amosite (brown asbestos)**
- **EA200 'Ch' Chrysotile (white asbestos)**
- **EA200 'Cr' Crocidolite (blue asbestos)**
- **EA200 'Trace' - Asbestos fibres detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres**
- **EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.**
- **EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.**
- **EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.**
- **EP080: The TRIP SPIKE and TRIP SPIKE CONTROL have been analysed for volatile TPH and BTEX only. The TRIP SPIKE and TRIP SPIKE CONTROL were prepared in the lab using reagent grade sand spiked with petrol. The TRIP SPIKE was dispatched from the lab and the TRIP SPIKE CONTROL retained.**



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_MW17_0.2	ML_MW23_0.1	ML_MW20_0.1	ML_MW21_0.1	ML_MW19_0.1
				14-OCT-2013 15:00	14-OCT-2013 15:00	14-OCT-2013 15:00	14-OCT-2013 15:00	14-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322435-001	ES1322435-002	ES1322435-003	ES1322435-004	ES1322435-005
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	7.8	17.1	4.9	5.6	5.9
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No
Asbestos Type	1332-21-4	0.1	--	-	-	-	-	-
Sample weight (dry)	----	0.01	g	50.8	52.0	231	76.8	257
APPROVED IDENTIFIER:	----	-	--	C.OWLER	C.OWLER	C.OWLER	C.OWLER	C.OWLER
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	18	<5	5	<5	10
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	13	4	9	3	12
Copper	7440-50-8	5	mg/kg	27	10	37	11	10
Lead	7439-92-1	5	mg/kg	23	15	19	18	20
Nickel	7440-02-0	2	mg/kg	47	23	33	11	12
Zinc	7440-66-6	5	mg/kg	89	31	81	115	30
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_MW17_0.2	ML_MW23_0.1	ML_MW20_0.1	ML_MW21_0.1	ML_MW19_0.1
				14-OCT-2013 15:00	14-OCT-2013 15:00	14-OCT-2013 15:00	14-OCT-2013 15:00	14-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322435-001	ES1322435-002	ES1322435-003	ES1322435-004	ES1322435-005
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<b>0.9</b>	<b>2.8</b>	<b>0.9</b>	<b>3.3</b>	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<b>1.9</b>	<b>0.6</b>	<b>1.8</b>	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<b>1.0</b>	<b>0.5</b>	<b>1.1</b>	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<b>0.6</b>	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<b>0.8</b>	<0.5	<b>0.7</b>	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<b>0.9</b>	<b>6.5</b>	<b>2.0</b>	<b>7.5</b>	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<b>80</b>	<50	<b>80</b>	<50
C15 - C28 Fraction	----	100	mg/kg	<b>110</b>	<b>560</b>	<100	<b>630</b>	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<b>140</b>	<100	<b>180</b>	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<b>110</b>	<b>780</b>	<50	<b>890</b>	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<b>130</b>	<50	<b>140</b>	<50
>C16 - C34 Fraction	----	100	mg/kg	<b>130</b>	<b>610</b>	<b>110</b>	<b>690</b>	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<b>130</b>	<b>740</b>	<b>110</b>	<b>830</b>	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<b>130</b>	<50	<b>140</b>	<50



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_MW17_0.2	ML_MW23_0.1	ML_MW20_0.1	ML_MW21_0.1	ML_MW19_0.1
				14-OCT-2013 15:00	14-OCT-2013 15:00	14-OCT-2013 15:00	14-OCT-2013 15:00	14-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322435-001	ES1322435-002	ES1322435-003	ES1322435-004	ES1322435-005
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	93.2	91.2	101	93.1	96.9
2-Chlorophenol-D4	93951-73-6	0.1	%	95.4	94.4	102	100	96.2
2,4,6-Tribromophenol	118-79-6	0.1	%	98.1	89.6	107	91.6	99.6
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	96.8	95.6	102	98.2	97.3
Anthracene-d10	1719-06-8	0.1	%	87.7	71.4	94.2	73.3	87.8
4-Terphenyl-d14	1718-51-0	0.1	%	80.1	75.3	83.1	76.2	79.0
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	96.0	90.2	90.3	101	101
Toluene-D8	2037-26-5	0.1	%	104	100	101	111	109
4-Bromofluorobenzene	460-00-4	0.1	%	104	103	100	108	111



## Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)

Client sample ID

				TRIP SPIKE	TRIP BLANK	TSC	---	---
				08-OCT-2013 15:00	08-OCT-2013 15:00	[16-OCT-2013]	---	---
				<b>ES1322435-006</b>	<b>ES1322435-007</b>	<b>ES1322435-008</b>	---	---
Compound	CAS Number	LOR	Unit					
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
<b>C6 - C9 Fraction</b>	---	10	mg/kg	<b>66</b>	<10	<b>82</b>	---	---
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
<b>C6 - C10 Fraction</b>	C6_C10	10	mg/kg	<b>76</b>	<10	<b>93</b>	---	---
<b>C6 - C10 Fraction minus BTEX (F1)</b>	C6_C10-BTEX	10	mg/kg	<b>49</b>	<10	<b>66</b>	---	---
<b>EP080: BTEXN</b>								
<b>Benzene</b>	71-43-2	0.2	mg/kg	<b>0.6</b>	<0.2	<b>0.6</b>	---	---
<b>Toluene</b>	108-88-3	0.5	mg/kg	<b>13.6</b>	<0.5	<b>13.4</b>	---	---
<b>Ethylbenzene</b>	100-41-4	0.5	mg/kg	<b>1.7</b>	<0.5	<b>1.7</b>	---	---
<b>meta- &amp; para-Xylene</b>	108-38-3 106-42-3	0.5	mg/kg	<b>7.8</b>	<0.5	<b>7.8</b>	---	---
<b>ortho-Xylene</b>	95-47-6	0.5	mg/kg	<b>3.2</b>	<0.5	<b>3.2</b>	---	---
<b>Sum of BTEX</b>	---	0.2	mg/kg	<b>26.9</b>	<0.2	<b>26.7</b>	---	---
<b>Total Xylenes</b>	1330-20-7	0.5	mg/kg	<b>11.0</b>	<0.5	<b>11.0</b>	---	---
<b>Naphthalene</b>	91-20-3	1	mg/kg	<1	<1	<1	---	---
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
<b>1,2-Dichloroethane-D4</b>	17060-07-0	0.1	%	<b>95.8</b>	<b>103</b>	<b>87.4</b>	---	---
<b>Toluene-D8</b>	2037-26-5	0.1	%	<b>94.6</b>	<b>103</b>	<b>90.2</b>	---	---
<b>4-Bromofluorobenzene</b>	460-00-4	0.1	%	<b>90.4</b>	<b>103</b>	<b>94.7</b>	---	---

## Analytical Results

### Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>		
EA200: Description	ML_MW17_0.2 - 14-OCT-2013 15:00	Dark grey - brown soil with some small grey rocks plus a trace of charcoal and vegetation.
EA200: Description	ML_MW23_0.1 - 14-OCT-2013 15:00	Dark grey soil with plenty of coal and charcoal pieces plus a trace of vegetation.
EA200: Description	ML_MW20_0.1 - 14-OCT-2013 15:00	Mid grey soil with some grey rocks plus some coal grains and a trace of vegetation.
EA200: Description	ML_MW21_0.1 - 14-OCT-2013 15:00	Dark grey soil with plenty of coal and charcoal pieces plus a trace of vegetation.
EA200: Description	ML_MW19_0.1 - 14-OCT-2013 15:00	Pale brown clay soil with some brown rocks plus a trace of vegetation.





## Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP075(SIM): Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
<b>EP075(SIM): PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: ES1322435</b>	<b>Page</b>	<b>: 1 of 11</b>
<b>Amendment</b>	<b>: 1</b>		
<b>Client</b>	<b>: ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	<b>: Environmental Division Sydney</b>
<b>Contact</b>	<b>: MR JONATHAN LEKAWSKI</b>	<b>Contact</b>	<b>: Barbara Hanna</b>
<b>Address</b>	<b>: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007</b>	<b>Address</b>	<b>: 277-289 Woodpark Road Smithfield NSW Australia 2164</b>
<b>E-mail</b>	<b>: jonathan.lekawski@erm.com</b>	<b>E-mail</b>	<b>: Barbara.Hanna@alsglobal.com</b>
<b>Telephone</b>	<b>: +61 02 8584 8888</b>	<b>Telephone</b>	<b>: +61 2 8784 8555</b>
<b>Facsimile</b>	<b>: +61 02 8584 8800</b>	<b>Facsimile</b>	<b>: +61 2 8784 8555</b>
<b>Project</b>	<b>: RPROJECT SYMPHONY - MP</b>	<b>QC Level</b>	<b>: NEPM 2013 Schedule B(3) and ALS QCS3 requirement</b>
<b>Site</b>	<b>: ----</b>		
<b>C-O-C number</b>	<b>: ----</b>	<b>Date Samples Received</b>	<b>: 16-OCT-2013</b>
<b>Sampler</b>	<b>: A.A</b>	<b>Issue Date</b>	<b>: 29-OCT-2013</b>
<b>Order number</b>	<b>: 0207423</b>	<b>No. of samples received</b>	<b>: 8</b>
<b>Quote number</b>	<b>: SY/278/13 V3</b>	<b>No. of samples analysed</b>	<b>: 8</b>

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



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Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Christopher Owler	Team Leader - Asbestos	Newcastle - Asbestos
Pabi Subba	Senior Organic Chemist	Sydney Organics



### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :            Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
                  CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
                  LOR = Limit of reporting  
                  RPD = Relative Percentage Difference  
                  # = Indicates failed QC



## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report							
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)		
<b>EA055: Moisture Content (QC Lot: 3114016)</b>											
ES1322331-003	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	<1.0	<1.0	0.0	No Limit		
ES1322434-015	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	18.2	18.8	3.5	0% - 50%		
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3113872)</b>											
ES1322434-002	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit		
		EG005T: Chromium	7440-47-3	2	mg/kg	8	9	0.0	No Limit		
		EG005T: Nickel	7440-02-0	2	mg/kg	9	9	0.0	No Limit		
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	6	0.0	No Limit		
		EG005T: Copper	7440-50-8	5	mg/kg	13	14	0.0	No Limit		
		EG005T: Lead	7439-92-1	5	mg/kg	15	15	0.0	No Limit		
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit		
		EG005T: Zinc	7440-66-6	5	mg/kg	35	37	4.8	No Limit		
ES1322434-007	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit		
		EG005T: Chromium	7440-47-3	2	mg/kg	6	10	41.2	No Limit		
		EG005T: Nickel	7440-02-0	2	mg/kg	6	8	17.4	No Limit		
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	7	32.4	No Limit		
		EG005T: Copper	7440-50-8	5	mg/kg	21	19	9.8	No Limit		
		EG005T: Lead	7439-92-1	5	mg/kg	18	22	16.4	No Limit		
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit		
		EG005T: Zinc	7440-66-6	5	mg/kg	26	29	8.4	No Limit		
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3113873)</b>											
ES1322434-002	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit		
ES1322434-007	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit		
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3109562)</b>											
ES1322434-002	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit		
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit		
		ES1322434-012	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3109562) - continued</b>									
ES1322434-012	Anonymous	EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit		
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3109562)</b>									
ES1322434-002	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
ES1322434-012	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3109562) - continued</b>										
ES1322434-012	Anonymous	EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3109561)</b>										
ES1322434-002	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit	
ES1322434-012	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3110821)</b>										
ES1322435-001	ML_MW17_0.2	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit	
ES1322513-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3109561)</b>										
ES1322434-002	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit	
ES1322434-012	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3110821)</b>										
ES1322435-001	ML_MW17_0.2	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit	
ES1322513-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit	
<b>EP080: BTEXN (QC Lot: 3110821)</b>										
ES1322435-001	ML_MW17_0.2	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
ES1322513-001	Anonymous	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit	
		EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	

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 Work Order : ES1322435 Amendment 1  
 Client : ENVIRO RESOURCES MANAGEMENT  
 Project : RPROJECT SYMPHONY - MP



Sub-Matrix: <b>SOIL</b>				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP080: BTEXN (QC Lot: 3110821) - continued</b>									
ES1322513-001	Anonymous	EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit





## Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3113872)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	112	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	105	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	107	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	122	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	110	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	115	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	93.3	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	108	81	133	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3113873)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	101	66	112	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3109562)</b>									
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	88.9	74	116	
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	98.3	74	116	
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	95.0	72	116	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	86.3	69	123	
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	85.0	60.3	117	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	89.4	69	117	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	82.8	68	112	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	86.9	73	117	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	80.6	76.4	114	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	92.2	57	111	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	85.1	68.9	112	
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	31.7	3.9	57	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3109562)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	105	80	124	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	105	77	123	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	108	79	123	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	106	77	123	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	110	79	123	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	107	79	123	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	110	79	123	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	113	79	125	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	85.2	73	121	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	105	81	123	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3109562) - continued</b>									
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	84.6	70	118	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	105	77	123	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	103	76	122	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	104	71	113	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	94.1	71.7	113	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	99.9	72.4	114	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3109561)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	97.8	71	131	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	101	74	138	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	89.4	64	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3110821)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	114	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3109561)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	98.2	70	130	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	98.2	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	
		50	mg/kg	----	150 mg/kg	71.8	63	131	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3110821)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	117	68.4	128	
<b>EP080: BTEXN (QCLot: 3110821)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	115	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	122	62	128	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	111	58	118	
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	106	60	120	
	106-42-3								
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	110	60	120	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	91.2	62	138	

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report				
				Spike Concentration	Spike Recovery(%)		Recovery Limits (%)	
					MS	Low	High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3113872)</b>								
ES1322434-002	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	99.0	70	130	
		EG005T: Cadmium	7440-43-9	50 mg/kg	95.9	70	130	



Sub-Matrix: SOIL

				Matrix Spike (MS) Report				
				Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3113872) - continued</b>								
ES1322434-002	Anonymous	EG005T: Chromium	7440-47-3	50 mg/kg	99.5	70	130	
		EG005T: Copper	7440-50-8	125 mg/kg	110	70	130	
		EG005T: Lead	7439-92-1	125 mg/kg	96.5	70	130	
		EG005T: Nickel	7440-02-0	50 mg/kg	100	70	130	
		EG005T: Selenium	7782-49-2	50 mg/kg	100	70	130	
		EG005T: Zinc	7440-66-6	125 mg/kg	92.5	70	130	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3113873)</b>								
ES1322434-002	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	116	70	130	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3109562)</b>								
ES1322434-002	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	73.3	70	130	
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	82.3	70	130	
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	75.2	60	130	
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	75.8	70	130	
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	67.4	20	130	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3109562)</b>								
ES1322434-002	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	85.4	70	130	
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	86.8	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3109561)</b>								
ES1322434-002	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	75.0	73	137	
		EP071: C15 - C28 Fraction	----	3140 mg/kg	76.4	53	131	
		EP071: C29 - C36 Fraction	----	2860 mg/kg	66.2	52	132	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3110821)</b>								
ES1322435-001	ML_MW17_0.2	EP080: C6 - C9 Fraction	----	32.5 mg/kg	116	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3109561)</b>								
ES1322434-002	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	94.8	73	137	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	70.4	53	131	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	53.4	52	132	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3110821)</b>								
ES1322435-001	ML_MW17_0.2	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	116	70	130	
<b>EP080: BTEXN (QCLot: 3110821)</b>								
ES1322435-001	ML_MW17_0.2	EP080: Benzene	71-43-2	2.5 mg/kg	95.1	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	98.2	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	94.8	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	94.7	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	94.4	70	130	
		EP080: Naphthalene	91-20-3	2.5 mg/kg	77.8	70	130	



### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
				Concentration	MS	MSD	Low	High	Value	Control Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3109561)</b>											
ES1322434-002	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	75.0	----	73	137	----	----	
		EP071: C15 - C28 Fraction	----	3140 mg/kg	76.4	----	53	131	----	----	
		EP071: C29 - C36 Fraction	----	2860 mg/kg	66.2	----	52	132	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3109561)</b>											
ES1322434-002	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	94.8	----	73	137	----	----	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	70.4	----	53	131	----	----	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	53.4	----	52	132	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3109562)</b>											
ES1322434-002	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	73.3	----	70	130	----	----	
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	82.3	----	70	130	----	----	
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	75.2	----	60	130	----	----	
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	75.8	----	70	130	----	----	
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	67.4	----	20	130	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3109562)</b>											
ES1322434-002	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	85.4	----	70	130	----	----	
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	86.8	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3110821)</b>											
ES1322435-001	ML_MW17_0.2	EP080: C6 - C9 Fraction	----	32.5 mg/kg	116	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3110821)</b>											
ES1322435-001	ML_MW17_0.2	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	116	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3110821)</b>											
ES1322435-001	ML_MW17_0.2	EP080: Benzene	71-43-2	2.5 mg/kg	95.1	----	70	130	----	----	
		EP080: Toluene	108-88-3	2.5 mg/kg	98.2	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	94.8	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	94.7	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	94.4	----	70	130	----	----	
		EP080: Naphthalene	91-20-3	2.5 mg/kg	77.8	----	70	130	----	----	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3113872)</b>											
ES1322434-002	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	99.0	----	70	130	----	----	
		EG005T: Cadmium	7440-43-9	50 mg/kg	95.9	----	70	130	----	----	
		EG005T: Chromium	7440-47-3	50 mg/kg	99.5	----	70	130	----	----	
		EG005T: Copper	7440-50-8	125 mg/kg	110	----	70	130	----	----	



Sub-Matrix: **SOIL**

				<i>Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report</i>						
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>Spike</i>	<i>Spike Recovery (%)</i>		<i>Recovery Limits (%)</i>		<i>RPDs (%)</i>	
				<i>Concentration</i>	<i>MS</i>	<i>MSD</i>	<i>Low</i>	<i>High</i>	<i>Value</i>	<i>Control Limit</i>
<b>EG005T: Total Metals by ICP-AES (QCLot: 3113872) - continued</b>										
ES1322434-002	Anonymous	EG005T: Lead	7439-92-1	125 mg/kg	96.5	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	100	----	70	130	----	----
		EG005T: Selenium	7782-49-2	50 mg/kg	100	----	70	130	----	----
		EG005T: Zinc	7440-66-6	125 mg/kg	92.5	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3113873)</b>										
ES1322434-002	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	116	----	70	130	----	----



## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1322435</b>	Page	: 1 of 6
Amendment	: <b>1</b>		
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: RPROJECT SYMPHONY - MP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 16-OCT-2013
Sampler	: A.A	Issue Date	: 29-OCT-2013
Order number	: 0207423		
Quote number	: SY/278/13 V3	No. of samples received	: 8
		No. of samples analysed	: 8

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EA055: Moisture Content</b>								
<b>Soil Glass Jar - Unpreserved (EA055-103)</b> ML_MW17_0.2, ML_MW20_0.1, ML_MW19_0.1	ML_MW23_0.1, ML_MW21_0.1	14-OCT-2013	----	----	----	18-OCT-2013	28-OCT-2013	✓
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
<b>Snap Lock Bag (EA200)</b> ML_MW17_0.2, ML_MW20_0.1, ML_MW19_0.1	ML_MW23_0.1, ML_MW21_0.1	14-OCT-2013	---	12-APR-2014	----	21-OCT-2013	19-APR-2014	✓
<b>EG005T: Total Metals by ICP-AES</b>								
<b>Soil Glass Jar - Unpreserved (EG005T)</b> ML_MW17_0.2, ML_MW20_0.1, ML_MW19_0.1	ML_MW23_0.1, ML_MW21_0.1	14-OCT-2013	18-OCT-2013	12-APR-2014	✓	19-OCT-2013	12-APR-2014	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
<b>Soil Glass Jar - Unpreserved (EG035T)</b> ML_MW17_0.2, ML_MW20_0.1, ML_MW19_0.1	ML_MW23_0.1, ML_MW21_0.1	14-OCT-2013	18-OCT-2013	11-NOV-2013	✓	21-OCT-2013	11-NOV-2013	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
<b>Soil Glass Jar - Unpreserved (EP071)</b> ML_MW17_0.2, ML_MW20_0.1, ML_MW19_0.1	ML_MW23_0.1, ML_MW21_0.1	14-OCT-2013	17-OCT-2013	28-OCT-2013	✓	18-OCT-2013	26-NOV-2013	✓
<b>EP075(SIM)A: Phenolic Compounds</b>								
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> ML_MW17_0.2, ML_MW20_0.1, ML_MW19_0.1	ML_MW23_0.1, ML_MW21_0.1	14-OCT-2013	17-OCT-2013	28-OCT-2013	✓	18-OCT-2013	26-NOV-2013	✓





Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> ML_MW17_0.2, ML_MW20_0.1, ML_MW19_0.1	ML_MW23_0.1, ML_MW21_0.1	14-OCT-2013	17-OCT-2013	28-OCT-2013	✓	18-OCT-2013	26-NOV-2013	✓
<b>EP080: BTEXN</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b> TRIP SPIKE,	TRIP BLANK	08-OCT-2013	17-OCT-2013	22-OCT-2013	✓	17-OCT-2013	22-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> ML_MW17_0.2, ML_MW20_0.1, ML_MW19_0.1	ML_MW23_0.1, ML_MW21_0.1	14-OCT-2013	17-OCT-2013	28-OCT-2013	✓	17-OCT-2013	28-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> TSC		16-OCT-2013	17-OCT-2013	30-OCT-2013	✓	17-OCT-2013	30-OCT-2013	✓
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b> TRIP SPIKE,	TRIP BLANK	08-OCT-2013	17-OCT-2013	22-OCT-2013	✓	17-OCT-2013	22-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> ML_MW17_0.2, ML_MW20_0.1, ML_MW19_0.1	ML_MW23_0.1, ML_MW21_0.1	14-OCT-2013	17-OCT-2013	28-OCT-2013	✓	17-OCT-2013	28-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> TSC		16-OCT-2013	17-OCT-2013	30-OCT-2013	✓	17-OCT-2013	30-OCT-2013	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Moisture Content	EA055-103	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	17	11.8	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	14	14.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	13	15.4	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	17	11.8	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	14	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	13	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	14	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	13	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	14	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	13	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Asbestos Identification in bulk solids	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (2013) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.



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## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### **Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes**

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.
- For all matrices, no Matrix Spike outliers occur.

#### **Regular Sample Surrogates**

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- No Analysis Holding Time Outliers exist.

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.
-

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

**Work Order** : ES1322435

**Amendment** : 1

<b>Client</b> : ENVIRO RESOURCES MANAGEMENT	<b>Laboratory</b> : Environmental Division Sydney
---	---

<b>Contact</b> : MR JONATHAN LEKAWSKI <b>Address</b> : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164
--	---

<b>E-mail</b> : jonathan.lekawski@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800	<b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555
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<b>Project</b> : RPROJECT SYMPHONY - MP	<b>Page</b> : 1 of 2
---	----------------------

<b>Order number</b> : 0207423 <b>C-O-C number</b> : ---- <b>Site</b> : ----	<b>Quote number</b> : ES2013ENVRES0370 (SY/278/13 V3)
---	---

<b>Sampler</b> : A.A	<b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement
----------------------	--

#### Dates

<b>Date Samples Received</b> : 16-OCT-2013 <b>Client Requested Due Date</b> : 22-OCT-2013	<b>Issue Date</b> : 25-OCT-2013 12:25 <b>Scheduled Reporting Date</b> : <b>22-OCT-2013</b>
--	---

#### Delivery Details

<b>Mode of Delivery</b> : Carrier <b>No. of coolers/boxes</b> : 2 HARD <b>Security Seal</b> : Intact.	<b>Temperature</b> : 6°C - Ice bricks present <b>No. of samples received</b> : 8 <b>No. of samples analysed</b> : 8
---	---

#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Asbestos analysis will be conducted by ALS Newcastle.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EA200 Asbestos Identification in Soils	SOIL - EG00CT (solids) Total Metals by ICP-AES	SOIL - S-18 (NO MOIST) TRH(C6-C9)/BTEXN with No Moisture for TBs	SOIL - S-27 TRH/BTEXN/PAH/Phenols/6Metals
ES1322435-001	14-OCT-2013 15:00	ML_MW17_0.2	✓	✓		✓
ES1322435-002	14-OCT-2013 15:00	ML_MW23_0.1	✓	✓		✓
ES1322435-003	14-OCT-2013 15:00	ML_MW20_0.1	✓	✓		✓
ES1322435-004	14-OCT-2013 15:00	ML_MW21_0.1	✓	✓		✓
ES1322435-005	14-OCT-2013 15:00	ML_MW19_0.1	✓	✓		✓
ES1322435-006	08-OCT-2013 15:00	TRIP SPIKE			✓	
ES1322435-007	08-OCT-2013 15:00	TRIP BLANK			✓	
ES1322435-008	[ 16-OCT-2013 ]	TSC			✓	

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
 Email jonathan.lekawski@erm.com  
 Email jonathan.lekawski@erm.com  
 Email jonathan.lekawski@erm.com  
 Email jonathan.lekawski@erm.com  
 Email jonathan.lekawski@erm.com  
 Email jonathan.lekawski@erm.com  
 Email jonathan.lekawski@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep)
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA
- A4 - AU Sample Receipt Notification - Environmental HT
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC)
- EDI Format - ENMRG
- EDI Format - EQUIS V5 ERM
- EDI Format - ESDAT
- EDI Format - XTab

Email symphony.deltawest@erm.com  
 Email symphony.deltawest@erm.com  
 Email symphony.deltawest@erm.com  
 Email symphony.deltawest@erm.com  
 Email symphony.deltawest@erm.com  
 Email symphony.deltawest@erm.com  
 Email symphony.deltawest@erm.com  
 Email symphony.deltawest@erm.com  
 Email symphony.deltawest@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com



# CHAIN OF CUSTODY

ALC Laboratory  
 please tick ->

DADE ALICE 21 Burrey Road Rosella SA 5095  
 Ph: 08 8399 0890 E: sales@alclab.com  
 DERBYVALE 32 Spring Street Sturtford QLD 4033  
 Ph: 07 3243 7222 E: samples@alclab.com  
 DELAWARE 49 Callendar Drive Clinton QLD 4890  
 Ph: 07 7471 5600 E: gordon@alclab.com

DMACKAY 79 Harbour Road Mackay QLD 4740  
 Ph: 07 4844 0177 E: mackay@alclab.com  
 DMELBOURNE 2-4 Vesey Road Springvale VIC 3177  
 Ph: 03 8849 5800 E: samples@alclab.com  
 DMUDGE 27 Sydney Road Mudgee NSW 2820  
 Ph: 02 6972 8795 E: mudgee@alclab.com

DMUNCASTLE 5 Rose Gum Road Warrbrook NSW 2204  
 Ph: 02 4566 9433 E: samples@alclab.com  
 DMUNSWAY 473 Geary Place North Nowra NSW 2541  
 Ph: 024423 2053 E: nowra@alclab.com  
 DPERTH 110 Hood Way Malaga WA 6090  
 Ph: 08 9209 7655 E: samples@alclab.com

DSYDNEY 277 286 Macquarie Road Smithfield NSW 2164  
 Ph: 02 8794 6655 E: samples@alclab.com  
 DTOWNSVILLE 74-75 Derrin Court Bone QLD 4818  
 Ph: 07 4786 0500 E: townsville@alclab.com  
 DWOLLONGONG 95 Kenny Street Wallongong NSW 2590  
 Ph: 02 4225 3129 E: perth@alclab.com

CLIENT: ERM

TURNAROUND REQUIREMENTS:

Standard TAT (last due date):  
 Non Standard or urgent TAT (last due date):

Office: Sydney

FOR LABORATORY USE ONLY (Circle)

PROJECT: Project Symphony - WW HP

ALS QUOTE NO.: SY127813

COC SEQUENCE NUMBER (circle)

RECEIVED BY: Steven

RECEIVED BY:

ORDER NUMBER: 0207423

CONTACT PH:

RELINQUISHED BY: A H HAWKINS

DATE/TIME: 16/10/13

DATE/TIME:

PROJECT MANAGER: Jonathan Lakawski

SAMPLER MOBILE: AWC A

DATE/TIME: 15/10/13

DATE/TIME: 16/10/13

DATE/TIME:

COC emailed to ALS? (YES / NO)

EDD FORMAT (or default): pdf/csv/excel

RELINQUISHED BY:

DATE/TIME:

DATE/TIME:

Email Reports to: (will default to PM if no other addresses are listed): Symphony.Delaware@alclab.com

Email Invoiced to: (will default to PM if no other addresses are listed): Symphony.Delaware@alclab.com

RELINQUISHED BY:

DATE/TIME:

DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ANALYSIS REQUIRED INCLUDING SUITES (NB: Suite Codes must be listed to attract suite price) where Metals are required, specify Total (unfiltered bottle required) or Dissolved (acid filtered bottle required).

RELINQUISHED BY:

DATE/TIME:

DATE/TIME:

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below)	(refer to	TOTAL CONTAINERS	S-27 (8 metals- As, Cd, Cr, Cu, Ni, Pb, Zn, Hg, TRIBTEX, PAH/Phenols)	Additional Metal - Se	Asbestos	VOC Scan	PCB	Particle Sizing (hydrometer), TOC-EP004	pH, Exchangeable Cations plus ECEC	TAM C-6g BTEX	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.	Additional Information
	ML-MW17-012	14.10.13	S			12	X	X	X							
	ML-MW23-011		S			2	X	X	X							
	ML-MW20-011		S			2	X	X	X							
	ML-MW21-011		S			2	X	X	X							
	ML-MW19-011	14.10.13	S			2	X	X	X							
	Trip Spike	8.10.13	S			1										
	Trip Blank	"	S			1										
	TSC	"	S			1										
<b>Environmental Division</b>																
<b>Sydney</b>																
<b>Work Order</b>																
<b>ES1322435</b>																
Telephone : +61-2-8764 8555																

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved Glass; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = PVA Vial (HCl Preserved); VS = VOA Vial Sodium Bisulphate Preserved; VAS = VOA Vial Sulphuric Preserved; AV = Airtight; Unpreserved Vial SG = Sulphuric Preserved Amber Glass; H = HCl Preserved; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Solids; B = Unpreserved Bag.



## CERTIFICATE OF ANALYSIS

Work Order	: <b>ES1322662</b>	Page	: 1 of 40
Client	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: 0287423 SYMPHONY	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 18-OCT-2013
C-O-C number	: 11722-23-24	Issue Date	: 31-OCT-2013
Sampler	: GP	No. of samples received	: 57
Site	: MT PIPER	No. of samples analysed	: 31
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EA200 Legend**
- **EA200 'Am' Amosite (brown asbestos)**
- **EA200 'Ch' Chrysotile (white asbestos)**
- **EA200 'Cr' Crocidolite (blue asbestos)**
- **EA200 'Trace' - Asbestos fibres detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres**
- **EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.**
- **EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.**
- **EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.**



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

## Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Christopher Owler	Team Leader - Asbestos	Newcastle - Asbestos
Nanthini Coilparampil	Laboratory Manager - Inorganics	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Organics



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK-SB52-0.1	MK-SB50-0.1	MK-SB16-1.5	D-141011-01-GP	MK-SB59-0.2
				14-OCT-2013 15:00	14-OCT-2013 15:00	14-OCT-2013 15:00	14-OCT-2013 15:00	15-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-001	ES1322662-002	ES1322662-003	ES1322662-004	ES1322662-005
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	9.6	10.9	23.0	11.9	16.6
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	----	No
Asbestos Type	1332-21-4	0.1	--	-	-	-	----	-
Sample weight (dry)	----	0.01	g	697	320	27.6	----	150
APPROVED IDENTIFIER:	----	-	--	C.OWLER	C.OWLER	C.OWLER	----	C.OWLER
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	5	7	27	10	15
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	1	1
Chromium	7440-47-3	2	mg/kg	<2	7	12	13	17
Copper	7440-50-8	5	mg/kg	<5	10	12	10	17
Lead	7439-92-1	5	mg/kg	8	20	17	23	21
Nickel	7440-02-0	2	mg/kg	6	12	46	15	47
Zinc	7440-66-6	5	mg/kg	38	33	84	37	80
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	0.1	mg/kg	----	<0.1	<0.1	----	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Benzene	71-43-2	0.2	mg/kg	----	<0.2	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg	----	<0.5	<0.5	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	----	<0.5	<0.5	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	<0.5	<0.5	----	----
Styrene	100-42-5	0.5	mg/kg	----	<0.5	<0.5	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	----	<0.5	<0.5	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg	----	<0.5	<0.5	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg	----	<0.5	<0.5	----	----
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	----	<0.5	<0.5	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	----	<0.5	<0.5	----	----
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	----	<0.5	<0.5	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	----	<0.5	<0.5	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	----	<0.5	<0.5	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK-SB52-0.1	MK-SB50-0.1	MK-SB16-1.5	D-141011-01-GP	MK-SB59-0.2
				14-OCT-2013 15:00	14-OCT-2013 15:00	14-OCT-2013 15:00	14-OCT-2013 15:00	15-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-001	ES1322662-002	ES1322662-003	ES1322662-004	ES1322662-005
<b>EP074A: Monocyclic Aromatic Hydrocarbons - Continued</b>								
n-Butylbenzene	104-51-8	0.5	mg/kg	----	<0.5	<0.5	----	----
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	----	<5	<5	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg	----	<5	<5	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	----	<5	<5	----	----
2-Hexanone (MBK)	591-78-6	5	mg/kg	----	<5	<5	----	----
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	----	<0.5	<0.5	----	----
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	----	<0.5	<0.5	----	----
1,2-Dichloropropane	78-87-5	0.5	mg/kg	----	<0.5	<0.5	----	----
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	----	<0.5	<0.5	----	----
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	----	<0.5	<0.5	----	----
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	----	<0.5	<0.5	----	----
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	----	<5	<5	----	----
Chloromethane	74-87-3	5	mg/kg	----	<5	<5	----	----
Vinyl chloride	75-01-4	5	mg/kg	----	<5	<5	----	----
Bromomethane	74-83-9	5	mg/kg	----	<5	<5	----	----
Chloroethane	75-00-3	5	mg/kg	----	<5	<5	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg	----	<5	<5	----	----
1,1-Dichloroethene	75-35-4	0.5	mg/kg	----	<0.5	<0.5	----	----
Iodomethane	74-88-4	0.5	mg/kg	----	<0.5	<0.5	----	----
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	----	<0.5	<0.5	----	----
1,1-Dichloroethane	75-34-3	0.5	mg/kg	----	<0.5	<0.5	----	----
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	----	<0.5	<0.5	----	----
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	----	<0.5	<0.5	----	----
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	----	<0.5	<0.5	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg	----	<0.5	<0.5	----	----
1,2-Dichloroethane	107-06-2	0.5	mg/kg	----	<0.5	<0.5	----	----
Trichloroethene	79-01-6	0.5	mg/kg	----	<0.5	<0.5	----	----
Dibromomethane	74-95-3	0.5	mg/kg	----	<0.5	<0.5	----	----
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	----	<0.5	<0.5	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK-SB52-0.1	MK-SB50-0.1	MK-SB16-1.5	D-141011-01-GP	MK-SB59-0.2
				14-OCT-2013 15:00	14-OCT-2013 15:00	14-OCT-2013 15:00	14-OCT-2013 15:00	15-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-001	ES1322662-002	ES1322662-003	ES1322662-004	ES1322662-005
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
1,3-Dichloropropane	142-28-9	0.5	mg/kg	----	<0.5	<0.5	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg	----	<0.5	<0.5	----	----
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	----	<0.5	<0.5	----	----
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	----	<0.5	<0.5	----	----
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	----	<0.5	<0.5	----	----
1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	----	<0.5	<0.5	----	----
1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	----	<0.5	<0.5	----	----
Pentachloroethane	76-01-7	0.5	mg/kg	----	<0.5	<0.5	----	----
1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	----	<0.5	<0.5	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg	----	<0.5	<0.5	----	----
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	----	<0.5	<0.5	----	----
Bromobenzene	108-86-1	0.5	mg/kg	----	<0.5	<0.5	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg	----	<0.5	<0.5	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg	----	<0.5	<0.5	----	----
1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	----	<0.5	<0.5	----	----
1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	----	<0.5	<0.5	----	----
1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	----	<0.5	<0.5	----	----
1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	----	<0.5	<0.5	----	----
1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	----	<0.5	<0.5	----	----
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	----	<0.5	<0.5	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg	----	<0.5	<0.5	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg	----	<0.5	<0.5	----	----
Bromoform	75-25-2	0.5	mg/kg	----	<0.5	<0.5	----	----
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	5	mg/kg	----	<5	<5	----	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK-SB52-0.1	MK-SB50-0.1	MK-SB16-1.5	D-141011-01-GP	MK-SB59-0.2
				14-OCT-2013 15:00	14-OCT-2013 15:00	14-OCT-2013 15:00	14-OCT-2013 15:00	15-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-001	ES1322662-002	ES1322662-003	ES1322662-004	ES1322662-005
<b>EP075(SIM)A: Phenolic Compounds - Continued</b>								
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK-SB52-0.1	MK-SB50-0.1	MK-SB16-1.5	D-141011-01-GP	MK-SB59-0.2
				14-OCT-2013 15:00	14-OCT-2013 15:00	14-OCT-2013 15:00	14-OCT-2013 15:00	15-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-001	ES1322662-002	ES1322662-003	ES1322662-004	ES1322662-005
<b>EP080/071: Total Petroleum Hydrocarbons - Continued</b>								
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	----	66.4	72.2	----	----
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	94.8	95.1	----	----
Toluene-D8	2037-26-5	0.1	%	----	96.5	103	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	----	94.9	96.7	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	102	96.8	100	99.8	101
2-Chlorophenol-D4	93951-73-6	0.1	%	106	101	105	104	106
2,4,6-Tribromophenol	118-79-6	0.1	%	96.2	96.6	95.9	99.6	97.0
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	100	95.6	99.5	97.6	99.7
Anthracene-d10	1719-06-8	0.1	%	91.5	87.0	90.2	89.1	91.2
4-Terphenyl-d14	1718-51-0	0.1	%	89.3	83.8	87.6	84.4	86.6





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK-SB52-0.1	MK-SB50-0.1	MK-SB16-1.5	D-141011-01-GP	MK-SB59-0.2
				14-OCT-2013 15:00	14-OCT-2013 15:00	14-OCT-2013 15:00	14-OCT-2013 15:00	15-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-001	ES1322662-002	ES1322662-003	ES1322662-004	ES1322662-005
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	105	107	102	111	106
Toluene-D8	2037-26-5	0.1	%	93.8	97.1	97.5	110	101
4-Bromofluorobenzene	460-00-4	0.1	%	96.4	98.5	97.6	106	101



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK-SB40-0.7	MK-SB39-1.0	MK-SB32-0.1	MK-SB31-0.2	MK-SB36-0.1
				15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-006	ES1322662-007	ES1322662-008	ES1322662-009	ES1322662-010
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	15.4	16.2	17.2	12.3	25.0
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No
Asbestos Type	1332-21-4	0.1	--	-	-	-	-	-
Sample weight (dry)	----	0.01	g	348	337	165	302	310
APPROVED IDENTIFIER:	----	-	--	C.OWLER	C.OWLER	C.OWLER	C.OWLER	C.OWLER
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	9	21	10	5	8
Cadmium	7440-43-9	1	mg/kg	<1	1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	10	15	7	9	17
Copper	7440-50-8	5	mg/kg	9	25	19	15	27
Lead	7439-92-1	5	mg/kg	18	26	23	17	32
Nickel	7440-02-0	2	mg/kg	28	64	43	16	17
Zinc	7440-66-6	5	mg/kg	49	117	190	36	31
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK-SB40-0.7	MK-SB39-1.0	MK-SB32-0.1	MK-SB31-0.2	MK-SB36-0.1
				15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-006	ES1322662-007	ES1322662-008	ES1322662-009	ES1322662-010
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK-SB40-0.7	MK-SB39-1.0	MK-SB32-0.1	MK-SB31-0.2	MK-SB36-0.1
				15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-006	ES1322662-007	ES1322662-008	ES1322662-009	ES1322662-010
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	97.3	99.1	96.4	97.6	98.0
2-Chlorophenol-D4	93951-73-6	0.1	%	101	104	100	103	103
2,4,6-Tribromophenol	118-79-6	0.1	%	95.3	92.6	93.9	94.5	95.5
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	97.4	98.7	96.5	97.9	97.8
Anthracene-d10	1719-06-8	0.1	%	88.7	89.2	87.1	88.7	89.0
4-Terphenyl-d14	1718-51-0	0.1	%	84.5	86.6	82.7	85.0	86.0
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	104	95.6	103	107	103
Toluene-D8	2037-26-5	0.1	%	103	93.5	102	102	100
4-Bromofluorobenzene	460-00-4	0.1	%	104	91.0	98.3	99.7	105



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK-SB37-0.3	MK-SB37-1.0	MK-SB38-0.5	MK-SB56-0.2	MK-SB55-0.2
				15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-011	ES1322662-012	ES1322662-013	ES1322662-014	ES1322662-015
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	----	16.1	15.0	15.5	14.3
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	----	----	No	No
Asbestos Type	1332-21-4	0.1	--	-	----	----	-	-
Sample weight (dry)	----	0.01	g	516	----	----	453	411
APPROVED IDENTIFIER:	----	-	--	C.OWLER	----	----	C.OWLER	C.OWLER
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	----	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	----	6	18	9	21
Cadmium	7440-43-9	1	mg/kg	----	<1	1	<1	2
Chromium	7440-47-3	2	mg/kg	----	13	13	12	8
Copper	7440-50-8	5	mg/kg	----	14	23	14	29
Lead	7439-92-1	5	mg/kg	----	21	21	18	31
Nickel	7440-02-0	2	mg/kg	----	<2	54	21	87
Zinc	7440-66-6	5	mg/kg	----	6	77	43	176
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	----	<0.1	<0.1	<0.1	<0.1
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	0.1	mg/kg	----	----	<0.1	----	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Benzene	71-43-2	0.2	mg/kg	----	----	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg	----	----	<0.5	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	----	----	<0.5	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	----	<0.5	----	----
Styrene	100-42-5	0.5	mg/kg	----	----	<0.5	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	----	----	<0.5	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg	----	----	<0.5	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg	----	----	<0.5	----	----
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	----	----	<0.5	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	----	----	<0.5	----	----
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	----	----	<0.5	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	----	----	<0.5	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	----	----	<0.5	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK-SB37-0.3	MK-SB37-1.0	MK-SB38-0.5	MK-SB56-0.2	MK-SB55-0.2
				15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-011	ES1322662-012	ES1322662-013	ES1322662-014	ES1322662-015
<b>EP074A: Monocyclic Aromatic Hydrocarbons - Continued</b>								
n-Butylbenzene	104-51-8	0.5	mg/kg	----	----	<0.5	----	----
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	----	----	<5	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg	----	----	<5	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	----	----	<5	----	----
2-Hexanone (MBK)	591-78-6	5	mg/kg	----	----	<5	----	----
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	----	----	<0.5	----	----
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	----	----	<0.5	----	----
1,2-Dichloropropane	78-87-5	0.5	mg/kg	----	----	<0.5	----	----
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	----	----	<0.5	----	----
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	----	----	<0.5	----	----
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	----	----	<0.5	----	----
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	----	----	<5	----	----
Chloromethane	74-87-3	5	mg/kg	----	----	<5	----	----
Vinyl chloride	75-01-4	5	mg/kg	----	----	<5	----	----
Bromomethane	74-83-9	5	mg/kg	----	----	<5	----	----
Chloroethane	75-00-3	5	mg/kg	----	----	<5	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg	----	----	<5	----	----
1,1-Dichloroethene	75-35-4	0.5	mg/kg	----	----	<0.5	----	----
Iodomethane	74-88-4	0.5	mg/kg	----	----	<0.5	----	----
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	----	----	<0.5	----	----
1,1-Dichloroethane	75-34-3	0.5	mg/kg	----	----	<0.5	----	----
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	----	----	<0.5	----	----
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	----	----	<0.5	----	----
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	----	----	<0.5	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg	----	----	<0.5	----	----
1,2-Dichloroethane	107-06-2	0.5	mg/kg	----	----	<0.5	----	----
Trichloroethene	79-01-6	0.5	mg/kg	----	----	<0.5	----	----
Dibromomethane	74-95-3	0.5	mg/kg	----	----	<0.5	----	----
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	----	----	<0.5	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK-SB37-0.3	MK-SB37-1.0	MK-SB38-0.5	MK-SB56-0.2	MK-SB55-0.2
				15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-011	ES1322662-012	ES1322662-013	ES1322662-014	ES1322662-015
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
1,3-Dichloropropane	142-28-9	0.5	mg/kg	----	----	<0.5	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg	----	----	<0.5	----	----
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	----	----	<0.5	----	----
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	----	----	<0.5	----	----
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	----	----	<0.5	----	----
1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	----	----	<0.5	----	----
1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	----	----	<0.5	----	----
Pentachloroethane	76-01-7	0.5	mg/kg	----	----	<0.5	----	----
1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	----	----	<0.5	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg	----	----	<0.5	----	----
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	----	----	<0.5	----	----
Bromobenzene	108-86-1	0.5	mg/kg	----	----	<0.5	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg	----	----	<0.5	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg	----	----	<0.5	----	----
1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	----	----	<0.5	----	----
1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	----	----	<0.5	----	----
1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	----	----	<0.5	----	----
1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	----	----	<0.5	----	----
1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	----	----	<0.5	----	----
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	----	----	<0.5	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg	----	----	<0.5	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg	----	----	<0.5	----	----
Bromoform	75-25-2	0.5	mg/kg	----	----	<0.5	----	----
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	5	mg/kg	----	----	<5	----	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	----	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK-SB37-0.3	MK-SB37-1.0	MK-SB38-0.5	MK-SB56-0.2	MK-SB55-0.2
				15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-011	ES1322662-012	ES1322662-013	ES1322662-014	ES1322662-015
<b>EP075(SIM)A: Phenolic Compounds - Continued</b>								
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	----	<2	<2	<2	<2
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	----	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	----	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	----	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	----	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	----	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	----	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	----	<50	<50	<50	<50



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK-SB37-0.3	MK-SB37-1.0	MK-SB38-0.5	MK-SB56-0.2	MK-SB55-0.2
				15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-011	ES1322662-012	ES1322662-013	ES1322662-014	ES1322662-015
<b>EP080/071: Total Petroleum Hydrocarbons - Continued</b>								
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	----	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	----	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	----	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	----	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	----	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	----	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	----	<50	<50	<50	<50
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	----	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	----	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	----	<1	<1	<1	<1
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	----	----	63.4	----	----
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	----	112	----	----
Toluene-D8	2037-26-5	0.1	%	----	----	109	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	----	----	107	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	----	98.1	99.7	101	97.7
2-Chlorophenol-D4	93951-73-6	0.1	%	----	104	105	105	103
2,4,6-Tribromophenol	118-79-6	0.1	%	----	91.7	94.9	94.4	93.5
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	----	98.6	99.0	98.2	97.3
Anthracene-d10	1719-06-8	0.1	%	----	90.0	90.2	89.4	86.4
4-Terphenyl-d14	1718-51-0	0.1	%	----	87.2	85.8	87.1	83.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK-SB37-0.3	MK-SB37-1.0	MK-SB38-0.5	MK-SB56-0.2	MK-SB55-0.2
				15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-011	ES1322662-012	ES1322662-013	ES1322662-014	ES1322662-015
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	106	89.2	97.7	99.7
Toluene-D8	2037-26-5	0.1	%	----	102	101	91.0	97.2
4-Bromofluorobenzene	460-00-4	0.1	%	----	104	108	92.6	95.4



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				MK-SB57-1.0	MK-SB68-0.1	MK-SB68-0.5	MK-SB39-5.0	MK-SB68-4.0
				15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-016	ES1322662-017	ES1322662-018	ES1322662-019	ES1322662-020
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	15.1	----	15.8	11.7	14.0
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	----	----	----
Asbestos Type	1332-21-4	0.1	--	-	-	----	----	----
Sample weight (dry)	----	0.01	g	261	246	----	----	----
APPROVED IDENTIFIER:	----	-	--	C.OWLER	C.OWLER	----	----	----
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	----	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	20	----	14	9	17
Cadmium	7440-43-9	1	mg/kg	<1	----	1	<1	1
Chromium	7440-47-3	2	mg/kg	9	----	16	8	16
Copper	7440-50-8	5	mg/kg	6	----	23	12	22
Lead	7439-92-1	5	mg/kg	11	----	21	17	23
Nickel	7440-02-0	2	mg/kg	15	----	60	24	61
Zinc	7440-66-6	5	mg/kg	31	----	113	46	92
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	<0.1	<0.1	<0.1
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	----	----	<0.1	<0.1
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	----	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
Styrene	100-42-5	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	----	----	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK-SB57-1.0	MK-SB68-0.1	MK-SB68-0.5	MK-SB39-5.0	MK-SB68-4.0
				15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-016	ES1322662-017	ES1322662-018	ES1322662-019	ES1322662-020
<b>EP074A: Monocyclic Aromatic Hydrocarbons - Continued</b>								
n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	<5	----	----	<5	<5
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	----	----	<5	<5
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	----	----	<5	<5
2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	----	----	<5	<5
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	----	----	<5	<5
Chloromethane	74-87-3	5	mg/kg	<5	----	----	<5	<5
Vinyl chloride	75-01-4	5	mg/kg	<5	----	----	<5	<5
Bromomethane	74-83-9	5	mg/kg	<5	----	----	<5	<5
Chloroethane	75-00-3	5	mg/kg	<5	----	----	<5	<5
Trichlorofluoromethane	75-69-4	5	mg/kg	<5	----	----	<5	<5
1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
Iodomethane	74-88-4	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	----	----	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK-SB57-1.0	MK-SB68-0.1	MK-SB68-0.5	MK-SB39-5.0	MK-SB68-4.0
				15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-016	ES1322662-017	ES1322662-018	ES1322662-019	ES1322662-020
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
Bromobenzene	108-86-1	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
Bromoform	75-25-2	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	5	mg/kg	<5	----	----	<5	<5
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	----	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK-SB57-1.0	MK-SB68-0.1	MK-SB68-0.5	MK-SB39-5.0	MK-SB68-4.0
				15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-016	ES1322662-017	ES1322662-018	ES1322662-019	ES1322662-020
<b>EP075(SIM)A: Phenolic Compounds - Continued</b>								
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	----	<2	<2	<2
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	----	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	----	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	----	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	----	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	----	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	----	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	<50	<50	<50





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK-SB57-1.0	MK-SB68-0.1	MK-SB68-0.5	MK-SB39-5.0	MK-SB68-4.0
				15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-016	ES1322662-017	ES1322662-018	ES1322662-019	ES1322662-020
<b>EP080/071: Total Petroleum Hydrocarbons - Continued</b>								
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	----	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	----	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	----	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	----	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	----	<50	<50	<50
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	----	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	----	<1	<1	<1
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	72.6	----	----	62.9	67.9
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	99.7	----	----	108	116
Toluene-D8	2037-26-5	0.1	%	99.0	----	----	103	108
4-Bromofluorobenzene	460-00-4	0.1	%	96.0	----	----	99.9	107
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	95.4	----	91.7	91.2	95.1
2-Chlorophenol-D4	93951-73-6	0.1	%	100	----	94.3	94.2	98.8
2,4,6-Tribromophenol	118-79-6	0.1	%	89.6	----	79.4	87.7	87.2
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	94.9	----	91.3	91.6	94.0
Anthracene-d10	1719-06-8	0.1	%	85.8	----	82.2	84.8	84.9
4-Terphenyl-d14	1718-51-0	0.1	%	83.2	----	79.0	82.2	82.6



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK-SB57-1.0	MK-SB68-0.1	MK-SB68-0.5	MK-SB39-5.0	MK-SB68-4.0
				15-OCT-2013 15:00	15-OCT-2013 15:00	15-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-016	ES1322662-017	ES1322662-018	ES1322662-019	ES1322662-020
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	102	----	103	107	107
Toluene-D8	2037-26-5	0.1	%	97.4	----	98.8	98.7	104
4-Bromofluorobenzene	460-00-4	0.1	%	101	----	97.4	99.1	102



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML-MW24-0.2	ML-MW03-0.2	ML-MW18-0.1	ML-MW05-0.5	D01-161013-TS
				16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-021	ES1322662-022	ES1322662-023	ES1322662-024	ES1322662-025
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	12.7	15.9	14.7	14.8	14.8
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	----
Asbestos Type	1332-21-4	0.1	--	-	-	-	-	----
Sample weight (dry)	----	0.01	g	255	106	78.6	437	----
APPROVED IDENTIFIER:	----	-	--	C.OWLER	C.OWLER	C.OWLER	C.OWLER	----
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	11	9	6	10	8
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	1	<1
Chromium	7440-47-3	2	mg/kg	5	5	3	13	8
Copper	7440-50-8	5	mg/kg	16	16	13	11	12
Lead	7439-92-1	5	mg/kg	18	18	20	20	16
Nickel	7440-02-0	2	mg/kg	20	30	12	12	12
Zinc	7440-66-6	5	mg/kg	50	58	35	57	37
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML-MW24-0.2	ML-MW03-0.2	ML-MW18-0.1	ML-MW05-0.5	D01-161013-TS
				16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-021	ES1322662-022	ES1322662-023	ES1322662-024	ES1322662-025
<b>EP074A: Monocyclic Aromatic Hydrocarbons - Continued</b>								
n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	<5	<5	<5
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	<5	<5	<5
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	<5	<5	<5
2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	<5	<5	<5
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	<5	<5	<5
Chloromethane	74-87-3	5	mg/kg	<5	<5	<5	<5	<5
Vinyl chloride	75-01-4	5	mg/kg	<5	<5	<5	<5	<5
Bromomethane	74-83-9	5	mg/kg	<5	<5	<5	<5	<5
Chloroethane	75-00-3	5	mg/kg	<5	<5	<5	<5	<5
Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	<5	<5	<5
1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML-MW24-0.2	ML-MW03-0.2	ML-MW18-0.1	ML-MW05-0.5	D01-161013-TS
				16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-021	ES1322662-022	ES1322662-023	ES1322662-024	ES1322662-025
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	5	mg/kg	<5	<5	<5	<5	<5
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML-MW24-0.2	ML-MW03-0.2	ML-MW18-0.1	ML-MW05-0.5	D01-161013-TS
				16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-021	ES1322662-022	ES1322662-023	ES1322662-024	ES1322662-025
<b>EP075(SIM)A: Phenolic Compounds - Continued</b>								
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	1.6	0.8	2.0	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	0.9	<0.5	1.8	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	0.8	<0.5	1.2	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.6	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	0.6	<0.5	0.8	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	4.4	0.8	6.4	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	1.2	1.2	1.2
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	80	<50	<50
C15 - C28 Fraction	----	100	mg/kg	140	100	630	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	180	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	140	100	890	<50	<50



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML-MW24-0.2	ML-MW03-0.2	ML-MW18-0.1	ML-MW05-0.5	D01-161013-TS
				16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-021	ES1322662-022	ES1322662-023	ES1322662-024	ES1322662-025
<b>EP080/071: Total Petroleum Hydrocarbons - Continued</b>								
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	150	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	160	120	690	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	160	120	840	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	150	<50	<50
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	62.4	67.5	66.4	64.5	63.1
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	96.1	95.6	101	99.4	92.9
Toluene-D8	2037-26-5	0.1	%	110	106	108	106	107
4-Bromofluorobenzene	460-00-4	0.1	%	100	101	104	103	101
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	97.3	93.5	92.9	93.1	99.0
2-Chlorophenol-D4	93951-73-6	0.1	%	94.0	96.3	97.2	93.4	101
2,4,6-Tribromophenol	118-79-6	0.1	%	85.4	91.0	81.7	91.8	95.6
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	88.4	90.8	90.5	87.1	92.4
Anthracene-d10	1719-06-8	0.1	%	73.9	78.2	67.0	76.4	80.1
4-Terphenyl-d14	1718-51-0	0.1	%	77.4	80.1	76.0	76.6	80.5





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML-MW24-0.2	ML-MW03-0.2	ML-MW18-0.1	ML-MW05-0.5	D01-161013-TS
				16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-021	ES1322662-022	ES1322662-023	ES1322662-024	ES1322662-025
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	94.8	94.4	99.4	97.6	92.2
Toluene-D8	2037-26-5	0.1	%	108	105	106	104	105
4-Bromofluorobenzene	460-00-4	0.1	%	102	102	103	104	103



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML-MW15-0.1	MA-MW12-0.1	MA-MW07-0.1	ML-MW12-0.1	ML-MW10-0.2
				16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-026	ES1322662-027	ES1322662-028	ES1322662-029	ES1322662-030
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	14.7	16.5	16.8	16.1	10.5
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No
Asbestos Type	1332-21-4	0.1	--	-	-	-	-	-
Sample weight (dry)	----	0.01	g	282	297	407	219	109
APPROVED IDENTIFIER:	----	-	--	C.OWLER	C.OWLER	C.OWLER	C.OWLER	C.OWLER
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	6	18	10	9	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	7	12	10	5	5
Copper	7440-50-8	5	mg/kg	8	15	16	12	<5
Lead	7439-92-1	5	mg/kg	16	21	19	15	7
Nickel	7440-02-0	2	mg/kg	14	27	22	17	2
Zinc	7440-66-6	5	mg/kg	32	40	53	38	34
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML-MW15-0.1	MA-MW12-0.1	MA-MW07-0.1	ML-MW12-0.1	ML-MW10-0.2
				16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-026	ES1322662-027	ES1322662-028	ES1322662-029	ES1322662-030
<b>EP074A: Monocyclic Aromatic Hydrocarbons - Continued</b>								
n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	<5	<5	<5
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	<5	<5	<5
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	<5	<5	<5
2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	<5	<5	<5
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	<5	<5	<5
Chloromethane	74-87-3	5	mg/kg	<5	<5	<5	<5	<5
Vinyl chloride	75-01-4	5	mg/kg	<5	<5	<5	<5	<5
Bromomethane	74-83-9	5	mg/kg	<5	<5	<5	<5	<5
Chloroethane	75-00-3	5	mg/kg	<5	<5	<5	<5	<5
Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	<5	<5	<5
1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML-MW15-0.1	MA-MW12-0.1	MA-MW07-0.1	ML-MW12-0.1	ML-MW10-0.2
				16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-026	ES1322662-027	ES1322662-028	ES1322662-029	ES1322662-030
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	5	mg/kg	<5	<5	<5	<5	<5
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML-MW15-0.1	MA-MW12-0.1	MA-MW07-0.1	ML-MW12-0.1	ML-MW10-0.2
				16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-026	ES1322662-027	ES1322662-028	ES1322662-029	ES1322662-030
<b>EP075(SIM)A: Phenolic Compounds - Continued</b>								
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML-MW15-0.1	MA-MW12-0.1	MA-MW07-0.1	ML-MW12-0.1	ML-MW10-0.2
				16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322662-026	ES1322662-027	ES1322662-028	ES1322662-029	ES1322662-030
<b>EP080/071: Total Petroleum Hydrocarbons - Continued</b>								
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	63.2	63.2	61.4	60.0	62.8
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	76.4	76.5	81.0	83.6	81.2
Toluene-D8	2037-26-5	0.1	%	116	116	123	118	119
4-Bromofluorobenzene	460-00-4	0.1	%	106	109	111	106	107
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	90.1	95.7	92.9	92.7	95.0
2-Chlorophenol-D4	93951-73-6	0.1	%	96.5	95.7	94.4	94.0	97.2
2,4,6-Tribromophenol	118-79-6	0.1	%	85.6	92.6	92.0	87.8	91.1
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	88.1	89.4	87.7	87.0	91.6
Anthracene-d10	1719-06-8	0.1	%	75.7	78.9	77.2	75.8	79.9
4-Terphenyl-d14	1718-51-0	0.1	%	75.8	79.7	77.2	76.8	79.8



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sample ID	ML-MW15-0.1	MA-MW12-0.1	MA-MW07-0.1	ML-MW12-0.1	ML-MW10-0.2
Client sampling date / time	16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00	16-OCT-2013 15:00

Compound	CAS Number	LOR	Unit	ES1322662-026	ES1322662-027	ES1322662-028	ES1322662-029	ES1322662-030
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	75.6	75.4	80.0	82.7	80.5
Toluene-D8	2037-26-5	0.1	%	114	114	121	116	117
4-Bromofluorobenzene	460-00-4	0.1	%	112	113	116	115	109





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

MK-SB10-1.5

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Client sampling date / time

14-OCT-2013 15:00

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Compound	CAS Number	LOR	Unit	ES1322662-031	---	---	---	---
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### EA055: Moisture Content

Moisture Content (dried @ 103°C)	---	1.0	%	21.6	---	---	---	---
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### EG005T: Total Metals by ICP-AES

Selenium	7782-49-2	5	mg/kg	<5	---	---	---	---
Arsenic	7440-38-2	5	mg/kg	6	---	---	---	---
Cadmium	7440-43-9	1	mg/kg	<1	---	---	---	---
Chromium	7440-47-3	2	mg/kg	16	---	---	---	---
Copper	7440-50-8	5	mg/kg	43	---	---	---	---
Lead	7439-92-1	5	mg/kg	35	---	---	---	---
Nickel	7440-02-0	2	mg/kg	17	---	---	---	---
Zinc	7440-66-6	5	mg/kg	34	---	---	---	---

### EG035T: Total Recoverable Mercury by FIMS

Mercury	7439-97-6	0.1	mg/kg	<0.1	---	---	---	---
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### EP075(SIM)A: Phenolic Compounds

Phenol	108-95-2	0.5	mg/kg	<0.5	---	---	---	---
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	---	---	---	---
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	---	---	---	---
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	---	---	---	---
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	---	---	---	---
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	---	---	---	---
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	---	---	---	---
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	---	---	---	---
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	---	---	---	---
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	---	---	---	---
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	---	---	---	---
Pentachlorophenol	87-86-5	2	mg/kg	<2	---	---	---	---

### EP075(SIM)B: Polynuclear Aromatic Hydrocarbons

Naphthalene	91-20-3	0.5	mg/kg	<0.5	---	---	---	---
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	---	---	---	---
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	---	---	---	---
Fluorene	86-73-7	0.5	mg/kg	<0.5	---	---	---	---
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	---	---	---	---
Anthracene	120-12-7	0.5	mg/kg	<0.5	---	---	---	---
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	---	---	---	---



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

MK-SB10-1.5

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Client sampling date / time

14-OCT-2013 15:00

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Compound	CAS Number	LOR	Unit	ES1322662-031	---	---	---	---
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### EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued

Pyrene	129-00-0	0.5	mg/kg	<0.5	---	---	---	---
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	---	---	---	---
Chrysene	218-01-9	0.5	mg/kg	<0.5	---	---	---	---
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	---	---	---	---
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	---	---	---	---
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	---	---	---	---
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	---	---	---	---
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	---	---	---	---
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	---	---	---	---
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	---	---	---	---
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	---	---	---	---
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	---	---	---	---
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	---	---	---	---

### EP080/071: Total Petroleum Hydrocarbons

C6 - C9 Fraction	----	10	mg/kg	<10	---	---	---	---
C10 - C14 Fraction	----	50	mg/kg	<50	---	---	---	---
C15 - C28 Fraction	----	100	mg/kg	<100	---	---	---	---
C29 - C36 Fraction	----	100	mg/kg	<100	---	---	---	---
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	---	---	---	---

### EP080/071: Total Recoverable Hydrocarbons - NEPM 2013

C6 - C10 Fraction	C6_C10	10	mg/kg	<10	---	---	---	---
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	---	---	---	---
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	---	---	---	---
>C16 - C34 Fraction	----	100	mg/kg	<100	---	---	---	---
>C34 - C40 Fraction	----	100	mg/kg	<100	---	---	---	---
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	---	---	---	---
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	---	---	---	---

### EP080: BTEXN

Benzene	71-43-2	0.2	mg/kg	<0.2	---	---	---	---
Toluene	108-88-3	0.5	mg/kg	<0.5	---	---	---	---
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	---	---	---	---
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	---	---	---	---



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

**MK-SB10-1.5**

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Client sampling date / time

14-OCT-2013 15:00

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Compound	CAS Number	LOR	Unit	ES1322662-031	----	----	----	----
<b>EP080: BTEXN - Continued</b>								
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	----	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg	<1	----	----	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	93.7	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	98.1	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%	93.7	----	----	----	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	93.1	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%	86.4	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	84.3	----	----	----	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	96.9	----	----	----	----
Toluene-D8	2037-26-5	0.1	%	95.6	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	93.4	----	----	----	----



## Analytical Results

### Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>		
EA200: Description	MK-SB52-0.1 - 14-OCT-2013 15:00	Pale grey sandy soil with some grey rocks plus a trace of vegetation.
EA200: Description	MK-SB50-0.1 - 14-OCT-2013 15:00	Pale grey - brown clay soil with a trace of vegetation.
EA200: Description	MK-SB16-1.5 - 14-OCT-2013 15:00	Pale grey - brown clay soil with a trace of vegetation.
EA200: Description	MK-SB59-0.2 - 15-OCT-2013 15:00	Pale grey - brown clay soil with some slag grains plus a trace of vegetation.
EA200: Description	MK-SB40-0.7 - 15-OCT-2013 15:00	Pale grey - brown clay soil with a trace of vegetation.
EA200: Description	MK-SB39-1.0 - 15-OCT-2013 15:00	Pale grey - brown clay soil with some slag grains plus a trace of vegetation.
EA200: Description	MK-SB32-0.1 - 15-OCT-2013 15:00	Pale grey - brown clay soil with some slag grains plus a trace of vegetation.
EA200: Description	MK-SB31-0.2 - 15-OCT-2013 15:00	Pale grey - brown clay soil with some slag grains plus a trace of vegetation.
EA200: Description	MK-SB36-0.1 - 15-OCT-2013 15:00	Mid grey clay soil with some small grey rocks plus a trace of vegetation.
EA200: Description	MK-SB37-0.3 - 15-OCT-2013 15:00	Mid grey clay soil with some small grey rocks plus a trace of vegetation.
EA200: Description	MK-SB56-0.2 - 15-OCT-2013 15:00	Mid grey clay soil with some small grey rocks and some slag grains plus a trace of vegetation.
EA200: Description	MK-SB55-0.2 - 15-OCT-2013 15:00	Mid grey clay soil with some small grey rocks and some slag grains plus a trace of vegetation.
EA200: Description	MK-SB57-1.0 - 15-OCT-2013 15:00	Pale brown clay soil with some small brown and grey rocks plus a trace of vegetation.
EA200: Description	MK-SB68-0.1 - 15-OCT-2013 15:00	Pale grey - brown clay soil with a trace of vegetation.
EA200: Description	ML-MW24-0.2 - 16-OCT-2013 15:00	Mid grey clay soil with some small grey rocks plus some coal and slag grains plus a trace of vegetation.
EA200: Description	ML-MW03-0.2 - 16-OCT-2013 15:00	Mid grey rocky soil with grey and brown rocks plus a trace of vegetation plus some coal grains.
EA200: Description	ML-MW18-0.1 - 16-OCT-2013 15:00	Dark grey soil with plenty of coal grains plus a trace of vegetation.
EA200: Description	ML-MW05-0.5 - 16-OCT-2013 15:00	Pale brown clay soil with some small grey rocks plus some quartz grains and a trace of vegetation.
EA200: Description	ML-MW15-0.1 - 16-OCT-2013 15:00	Pale grey - brown clay soil with some small grey rocks plus some coal and charcoal grains and a trace of vegetation.
EA200: Description	MA-MW12-0.1 - 16-OCT-2013 15:00	Pale grey - brown clay soil with some small grey rocks plus some coal grains with a trace of vegetation.
EA200: Description	MA-MW07-0.1 - 16-OCT-2013 15:00	Pale grey - brown clay soil with some small grey rocks plus some coal grains with a trace of vegetation.
EA200: Description	ML-MW12-0.1 - 16-OCT-2013 15:00	Pale grey - brown clay soil with some small grey rocks plus some coal grains and a trace of vegetation.
EA200: Description	ML-MW10-0.2 - 16-OCT-2013 15:00	Pale orange - brown clay soil with some grey rocks and a trace of vegetation.



## Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP066S: PCB Surrogate</b>			
Decachlorobiphenyl	2051-24-3	39	149
<b>EP074S: VOC Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	64	130
Toluene-D8	2037-26-5	66	136
4-Bromofluorobenzene	460-00-4	60	122
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: ES1322662</b>	<b>Page</b>	<b>: 1 of 25</b>
<b>Client</b>	<b>: ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	<b>: Environmental Division Sydney</b>
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<b>Project</b>	<b>: 0287423 SYMPHONY</b>	<b>QC Level</b>	<b>: NEPM 2013 Schedule B(3) and ALS QCS3 requirement</b>
<b>Site</b>	<b>: MT PIPER</b>	<b>Date Samples Received</b>	<b>: 18-OCT-2013</b>
<b>C-O-C number</b>	<b>: 11722-23-24</b>	<b>Issue Date</b>	<b>: 31-OCT-2013</b>
<b>Sampler</b>	<b>: GP</b>	<b>No. of samples received</b>	<b>: 57</b>
<b>Order number</b>	<b>: ----</b>	<b>No. of samples analysed</b>	<b>: 31</b>
<b>Quote number</b>	<b>: SY/278/13 V3</b>		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :  
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
RPD = Relative Percentage Difference  
# = Indicates failed QC



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

## Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Christopher Owler	Team Leader - Asbestos	Newcastle - Asbestos
Nanthini Coilparampil	Laboratory Manager - Inorganics	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Organics





## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EA055: Moisture Content (QC Lot: 3120797)</b>									
ES1322662-003	MK-SB16-1.5	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	23.0	22.9	0.0	0% - 20%
ES1322662-015	MK-SB55-0.2	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	14.3	13.5	6.1	0% - 50%
<b>EA055: Moisture Content (QC Lot: 3120798)</b>									
ES1322662-025	D01-161013-TS	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	14.8	15.4	4.0	0% - 50%
ES1322741-005	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	1.2	1.4	10.0	No Limit
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3120623)</b>									
ES1322620-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	7	7	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	5	4	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	68	73	6.2	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	25	34	31.9	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	57	74	26.4	0% - 50%
ES1322747-012	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	24	19	21.7	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	4	4	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	8	<5	48.8	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	25	37	36.6	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	10	12	24.8	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	25	28	11.2	No Limit
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3120774)</b>									
ES1322662-001	MK-SB52-0.1	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	6	6	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	8	8	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	38	38	0.0	No Limit
ES1322662-009	MK-SB31-0.2	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	9	12	27.7	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	16	25	46.9	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	5	7	21.8	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	15	16	9.6	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3120774) - continued</b>										
ES1322662-009	MK-SB31-0.2	EG005T: Lead	7439-92-1	5	mg/kg	17	19	10.9	No Limit	
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit	
		EG005T: Zinc	7440-66-6	5	mg/kg	36	48	28.1	No Limit	
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3120776)</b>										
ES1322662-021	ML-MW24-0.2	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit	
		EG005T: Chromium	7440-47-3	2	mg/kg	5	6	0.0	No Limit	
		EG005T: Nickel	7440-02-0	2	mg/kg	20	20	0.0	0% - 50%	
		EG005T: Arsenic	7440-38-2	5	mg/kg	11	10	11.8	No Limit	
		EG005T: Copper	7440-50-8	5	mg/kg	16	16	0.0	No Limit	
		EG005T: Lead	7439-92-1	5	mg/kg	18	20	9.8	No Limit	
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit	
		EG005T: Zinc	7440-66-6	5	mg/kg	50	57	13.1	0% - 50%	
ES1322871-005	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit	
		EG005T: Chromium	7440-47-3	2	mg/kg	<2	2	0.0	No Limit	
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	2	0.0	No Limit	
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit	
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit	
		EG005T: Lead	7439-92-1	5	mg/kg	16	16	0.0	No Limit	
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit	
		EG005T: Zinc	7440-66-6	5	mg/kg	35	34	3.4	No Limit	
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3120624)</b>										
ES1322620-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit	
ES1322747-012	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit	
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3120775)</b>										
ES1322662-001	MK-SB52-0.1	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit	
ES1322662-021	ML-MW24-0.2	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit	
<b>EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 3118935)</b>										
ES1322662-002	MK-SB50-0.1	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit	
ES1322662-025	D01-161013-TS	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3117379)</b>										
ES1322662-021	ML-MW24-0.2	EP074: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP074: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			106-42-3							
		EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3117379) - continued</b>										
ES1322662-021	ML-MW24-0.2	EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
ES1322662-025	D01-161013-TS	EP074: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP074: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			106-42-3							
		EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
<b>EP074B: Oxygenated Compounds (QC Lot: 3117379)</b>										
ES1322662-021	ML-MW24-0.2	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.0	No Limit	
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.0	No Limit	
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.0	No Limit	
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.0	No Limit	
ES1322662-025	D01-161013-TS	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.0	No Limit	
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.0	No Limit	
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.0	No Limit	
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.0	No Limit	
<b>EP074C: Sulfonated Compounds (QC Lot: 3117379)</b>										
ES1322662-021	ML-MW24-0.2	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
ES1322662-025	D01-161013-TS	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
<b>EP074D: Fumigants (QC Lot: 3117379)</b>										
ES1322662-021	ML-MW24-0.2	EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
ES1322662-025	D01-161013-TS	EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074D: Fumigants (QC Lot: 3117379) - continued</b>									
ES1322662-025	D01-161013-TS	EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3117379)</b>									
ES1322662-021	ML-MW24-0.2	EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.0	No Limit
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.0	No Limit		
ES1322662-025	D01-161013-TS	EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3117379) - continued</b>									
ES1322662-025	D01-161013-TS	EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.0	No Limit
EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.0	No Limit		
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.0	No Limit		
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3117379)</b>									
ES1322662-021	ML-MW24-0.2	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		ES1322662-025	D01-161013-TS	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5
EP074: Bromobenzene	108-86-1			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP074: 2-Chlorotoluene	95-49-8			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP074: 4-Chlorotoluene	106-43-4			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP074: 1,3-Dichlorobenzene	541-73-1			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP074: 1,4-Dichlorobenzene	106-46-7			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP074: 1,2-Dichlorobenzene	95-50-1			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP074: 1,2,4-Trichlorobenzene	120-82-1			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
<b>EP074G: Trihalomethanes (QC Lot: 3117379)</b>									



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074G: Trihalomethanes (QC Lot: 3117379) - continued</b>									
ES1322662-021	ML-MW24-0.2	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1322662-025	D01-161013-TS	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074H: Naphthalene (QC Lot: 3117379)</b>									
ES1322662-021	ML-MW24-0.2	EP074: Naphthalene	91-20-3	5	mg/kg	<5	<5	0.0	No Limit
ES1322662-025	D01-161013-TS	EP074: Naphthalene	91-20-3	5	mg/kg	<5	<5	0.0	No Limit
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3119472)</b>									
ES1322662-021	ML-MW24-0.2	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
		ES1322731-026	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5
EP075(SIM): 2-Chlorophenol	95-57-8			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2-Methylphenol	95-48-7			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2-Nitrophenol	88-75-5			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2,4-Dimethylphenol	105-67-9			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2,4-Dichlorophenol	120-83-2			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2,6-Dichlorophenol	87-65-0			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 3- & 4-Methylphenol	1319-77-3			1	mg/kg	<1	<1	0.0	No Limit
EP075(SIM): Pentachlorophenol	87-86-5			2	mg/kg	<2	<2	0.0	No Limit
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3123458)</b>									
ES1322662-001	MK-SB52-0.1	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3123458) - continued</b>									
ES1322662-001	MK-SB52-0.1	EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
ES1322662-012	MK-SB37-1.0	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
		<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3119472)</b>							
ES1322662-021	ML-MW24-0.2	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	1.6	1.7	10.8	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	0.9	1.2	21.4	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	0.8	1.0	19.4	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	0.6	0.7	21.1	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	0.5	0.7	31.1	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	4.4	5.3	18.6	0% - 50%





Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3119472) - continued</b>									
ES1322662-021	ML-MW24-0.2	EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1322731-026	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3123458)</b>									
ES1322662-001	MK-SB52-0.1	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3123458) - continued</b>									
ES1322662-012	MK-SB37-1.0	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenzo(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3117380)</b>									
ES1322662-021	ML-MW24-0.2	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1322662-025	D01-161013-TS	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3119471)</b>									
ES1322662-021	ML-MW24-0.2	EP071: C15 - C28 Fraction	----	100	mg/kg	140	150	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1322731-026	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3123009)</b>									
ES1322662-001	MK-SB52-0.1	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1322662-010	MK-SB36-0.1	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3123457)</b>									
ES1322662-001	MK-SB52-0.1	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1322662-012	MK-SB37-1.0	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3117380)</b>									



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3117380) - continued</b>										
ES1322662-021	ML-MW24-0.2	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit	
ES1322662-025	D01-161013-TS	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3119471)</b>										
ES1322662-021	ML-MW24-0.2	EP071: >C16 - C34 Fraction	----	100	mg/kg	160	170	7.4	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit	
ES1322731-026	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3123009)</b>										
ES1322662-001	MK-SB52-0.1	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit	
ES1322662-010	MK-SB36-0.1	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3123457)</b>										
ES1322662-001	MK-SB52-0.1	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit	
ES1322662-012	MK-SB37-1.0	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit	
<b>EP080: BTEXN (QC Lot: 3117380)</b>										
ES1322662-021	ML-MW24-0.2	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
ES1322662-025	D01-161013-TS	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit	
		EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			106-42-3							
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit			
EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit			
<b>EP080: BTEXN (QC Lot: 3123009)</b>										
ES1322662-001	MK-SB52-0.1	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
	106-42-3									

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 Work Order : ES1322662  
 Client : ENVIRO RESOURCES MANAGEMENT  
 Project : 0287423 SYMPHONY



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
<b>EP080: BTEXN (QC Lot: 3123009) - continued</b>										
ES1322662-001	MK-SB52-0.1	EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit	
ES1322662-010	MK-SB36-0.1	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit		



### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3120623)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	113	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	106	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	119	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	118	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	108	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	119	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	111	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	113	81	133	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3120774)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	103	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	105	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	98.2	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	109	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	97.8	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	105	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	81.2	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	108	81	133	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3120776)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	109	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	109	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	103	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	112	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	103	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	109	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	96.1	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	113	81	133	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3120624)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	85.9	66	112	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3120775)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	86.2	66	112	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3120777)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	85.0	66	112	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3118935)</b>									
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	87.4	57.4	117	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3117379)</b>									
EP074: Benzene	71-43-2	0.5	mg/kg	<0.5	1 mg/kg	90.4	64	118	
EP074: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	90.9	65	133	
EP074: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	85.3	65	127	
EP074: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	97.6	69	127	
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	86.6	64	126	
EP074: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	95.8	65	119	
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	86.0	66	128	
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	83.9	63	129	
EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	87.2	63	129	
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	84.0	64	130	
EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	83.0	63	129	
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	87.2	63	129	
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	77.1	62	130	
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	79.2	61	131	
<b>EP074B: Oxygenated Compounds (QCLot: 3117379)</b>									
EP074: Vinyl Acetate	108-05-4	1 5	mg/kg mg/kg	---- <5	10 mg/kg ----	# 26.9 ----	29.6 ----	156 ----	
EP074: 2-Butanone (MEK)	78-93-3	1 5	mg/kg mg/kg	---- <5	10 mg/kg ----	122 ----	58 ----	136 ----	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	1 5	mg/kg mg/kg	---- <5	10 mg/kg ----	106 ----	54 ----	138 ----	
EP074: 2-Hexanone (MBK)	591-78-6	1 5	mg/kg mg/kg	---- <5	10 mg/kg ----	101 ----	54 ----	136 ----	
<b>EP074C: Sulfonated Compounds (QCLot: 3117379)</b>									
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	60.9	54	126	
<b>EP074D: Fumigants (QCLot: 3117379)</b>									
EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	78.5	55	133	
EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	95.8	69	127	
EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	85.0	54	124	
EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	77.5	51	125	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	95.4	66	126	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3117379)</b>									
EP074: Dichlorodifluoromethane	75-71-8	1 5	mg/kg mg/kg	---- <5	10 mg/kg ----	44.1 ----	30 ----	148 ----	
EP074: Chloromethane	74-87-3	1 5	mg/kg mg/kg	---- <5	10 mg/kg ----	54.8 ----	41 ----	141 ----	
EP074: Vinyl chloride	75-01-4	1 5	mg/kg mg/kg	---- <5	10 mg/kg ----	61.6 ----	43 ----	147 ----	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3117379) - continued</b>									
EP074: Bromomethane	74-83-9	1	mg/kg	----	10 mg/kg	66.2	47	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloroethane	75-00-3	1	mg/kg	----	10 mg/kg	73.8	49	143	
		5	mg/kg	<5	----	----	----	----	
EP074: Trichlorofluoromethane	75-69-4	1	mg/kg	----	10 mg/kg	73.2	49	135	
		5	mg/kg	<5	----	----	----	----	
EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	78.8	54	126	
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	69.2	43	129	
EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	81.0	62	130	
EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	89.9	66	132	
EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	94.5	66	132	
EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	84.5	62	126	
EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	89.0	64	128	
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	81.5	59	125	
EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	98.1	65	123	
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	91.4	64	120	
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	96.1	65	127	
EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	92.9	70	130	
EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	97.7	72	128	
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	89.3	67	143	
EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	83.2	62	122	
EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	73.2	54	128	
EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	79.1	55	129	
EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	95.4	56	132	
EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	102	65	135	
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	74.4	19.8	134	
EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	79.0	53	129	
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	81.3	48	136	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3117379)</b>									
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	87.4	70	128	
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	83.6	67	127	
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	86.4	64	130	
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	87.7	62	130	
EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	83.7	63	129	
EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	84.6	63	129	
EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	90.2	66	128	
EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	72.4	54	134	
EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	81.2	60	132	
<b>EP074G: Trihalomethanes (QCLot: 3117379)</b>									





Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074G: Trihalomethanes (QCLot: 3117379) - continued</b>									
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	94.8	62	120	
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	86.7	61	121	
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	72.4	63	121	
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	82.7	60	126	
<b>EP074H: Naphthalene (QCLot: 3117379)</b>									
EP074: Naphthalene	91-20-3	0.5	mg/kg	----	1 mg/kg	86.0	63	133	
		5	mg/kg	<5	----	----	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3119472)</b>									
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	96.2	74	116	
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	92.2	74	116	
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	86.1	72	116	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	81.9	69	123	
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	82.9	60.3	117	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	87.5	69	117	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	82.1	68	112	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	85.2	73	117	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	85.6	76.4	114	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	82.0	57	111	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	90.3	68.9	112	
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	22.3	3.9	57	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3123458)</b>									
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	89.4	74	116	
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	86.4	74	116	
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	93.7	72	116	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	97.1	69	123	
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	71.0	60.3	117	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	90.6	69	117	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	81.3	68	112	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	85.0	73	117	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	82.6	76.4	114	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	73.6	57	111	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	72.0	68.9	112	
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	22.8	3.9	57	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3119472)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	91.1	80	124	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	94.1	77	123	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	98.0	79	123	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	95.6	77	123	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3119472) - continued</b>									
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	99.9	79	123	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	99.0	79	123	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	100	79	123	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	102	79	125	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	92.1	73	121	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	98.1	81	123	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	94.9	70	118	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	105	77	123	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	96.6	76	122	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	91.0	71	113	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	91.3	71.7	113	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	86.5	72.4	114	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3123458)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	90.8	80	124	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	96.0	77	123	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	93.6	79	123	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	96.8	77	123	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	98.4	79	123	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	97.6	79	123	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	97.3	79	123	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	99.6	79	125	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	85.6	73	121	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	89.0	81	123	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	83.4	70	118	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	87.2	77	123	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	90.2	76	122	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	71.3	71	113	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	74.2	71.7	113	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	75.4	72.4	114	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3117380)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	98.9	68.4	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3119471)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	87.5	71	131	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	89.3	74	138	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	86.8	64	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3123009)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	93.2	68.4	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3123457)</b>									



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	High
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3123457) - continued</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	90.1	71	131	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	90.0	74	138	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	82.9	64	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3117380)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	95.8	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3119471)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	94.8	70	130	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	85.5	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	
		50	mg/kg	----	150 mg/kg	86.9	63	131	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3123009)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	96.9	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3123457)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	92.7	70	130	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	87.2	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	
		50	mg/kg	----	150 mg/kg	66.4	63	131	
<b>EP080: BTEXN (QCLot: 3117380)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	95.3	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	125	62	128	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	102	58	118	
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	116	60	120	
	106-42-3								
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	115	60	120	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	85.8	62	138	
<b>EP080: BTEXN (QCLot: 3123009)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	92.4	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	91.0	62	128	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	88.5	58	118	
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	92.5	60	120	
	106-42-3								
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	89.4	60	120	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	91.2	62	138	

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.



Sub-Matrix: SOIL

				Matrix Spike (MS) Report			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike	Spike Recovery(%)	Recovery Limits (%)	
				Concentration	MS	Low	High
<b>EG005T: Total Metals by ICP-AES (QCLot: 3120623)</b>							
ES1322620-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	108	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	106	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	111	70	130
		EG005T: Copper	7440-50-8	125 mg/kg	127	70	130
		EG005T: Lead	7439-92-1	125 mg/kg	114	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	108	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	106	70	130
		EG005T: Zinc	7440-66-6	125 mg/kg	112	70	130
<b>EG005T: Total Metals by ICP-AES (QCLot: 3120774)</b>							
ES1322662-001	MK-SB52-0.1	EG005T: Arsenic	7440-38-2	50 mg/kg	105	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	103	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	104	70	130
		EG005T: Copper	7440-50-8	125 mg/kg	100	70	130
		EG005T: Lead	7439-92-1	125 mg/kg	106	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	105	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	105	70	130
		EG005T: Zinc	7440-66-6	125 mg/kg	108	70	130
<b>EG005T: Total Metals by ICP-AES (QCLot: 3120776)</b>							
ES1322662-021	ML-MW24-0.2	EG005T: Arsenic	7440-38-2	50 mg/kg	92.3	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	102	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	106	70	130
		EG005T: Copper	7440-50-8	125 mg/kg	104	70	130
		EG005T: Lead	7439-92-1	125 mg/kg	101	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	115	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	97.3	70	130
		EG005T: Zinc	7440-66-6	125 mg/kg	105	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3120624)</b>							
ES1322620-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	110	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3120775)</b>							
ES1322662-001	MK-SB52-0.1	EG035T: Mercury	7439-97-6	5 mg/kg	113	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3120777)</b>							
ES1322662-021	ML-MW24-0.2	EG035T: Mercury	7439-97-6	5 mg/kg	105	70	130
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3118935)</b>							
ES1322662-002	MK-SB50-0.1	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	95.6	70	130
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3117379)</b>							
ES1322662-021	ML-MW24-0.2	EP074: Benzene	71-43-2	2.5 mg/kg	77.7	70	130
		EP074: Toluene	108-88-3	2.5 mg/kg	88.5	70	130



Sub-Matrix: SOIL

				Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3117379)</b>							
ES1322662-021	ML-MW24-0.2	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	71.2	70	130
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	77.1	70	130
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3117379)</b>							
ES1322662-021	ML-MW24-0.2	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	87.1	70	130
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3119472)</b>							
ES1322662-021	ML-MW24-0.2	EP075(SIM): Phenol	108-95-2	10 mg/kg	90.3	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	84.6	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	77.7	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	73.4	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	65.2	20	130
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3123458)</b>							
ES1322662-001	MK-SB52-0.1	EP075(SIM): Phenol	108-95-2	10 mg/kg	84.7	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	83.5	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	72.8	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	82.2	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	68.0	20	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3119472)</b>							
ES1322662-021	ML-MW24-0.2	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	87.9	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	82.4	70	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3123458)</b>							
ES1322662-001	MK-SB52-0.1	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	85.1	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	91.8	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3117380)</b>							
ES1322662-021	ML-MW24-0.2	EP080: C6 - C9 Fraction	----	32.5 mg/kg	77.5	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3119471)</b>							
ES1322662-021	ML-MW24-0.2	EP071: C10 - C14 Fraction	----	640 mg/kg	74.8	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	75.3	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	65.2	52	132
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3123009)</b>							
ES1322662-001	MK-SB52-0.1	EP080: C6 - C9 Fraction	----	32.5 mg/kg	117	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3123457)</b>							
ES1322662-001	MK-SB52-0.1	EP071: C10 - C14 Fraction	----	640 mg/kg	87.7	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	85.0	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	70.8	52	132
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3117380)</b>							
ES1322662-021	ML-MW24-0.2	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	74.9	70	130



Sub-Matrix: SOIL

				Matrix Spike (MS) Report				
				Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3119471)</b>								
ES1322662-021	ML-MW24-0.2	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	94.6	73	137	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	69.1	53	131	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	53.6	52	132	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3123009)</b>								
ES1322662-001	MK-SB52-0.1	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	115	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3123457)</b>								
ES1322662-001	MK-SB52-0.1	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	109	73	137	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	77.3	53	131	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	72.4	52	132	
<b>EP080: BTEXN (QCLot: 3117380)</b>								
ES1322662-021	ML-MW24-0.2	EP080: Benzene	71-43-2	2.5 mg/kg	75.4	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	84.6	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	78.4	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	87.9	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	87.3	70	130	
EP080: Naphthalene	91-20-3	2.5 mg/kg	77.5	70	130			
<b>EP080: BTEXN (QCLot: 3123009)</b>								
ES1322662-001	MK-SB52-0.1	EP080: Benzene	71-43-2	2.5 mg/kg	100	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	102	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	107	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	107	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	107	70	130	
EP080: Naphthalene	91-20-3	2.5 mg/kg	96.7	70	130			

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3117379)</b>										
ES1322662-021	ML-MW24-0.2	EP074: Benzene	71-43-2	2.5 mg/kg	77.7	----	70	130	----	----
		EP074: Toluene	108-88-3	2.5 mg/kg	88.5	----	70	130	----	----
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3117379)</b>										
ES1322662-021	ML-MW24-0.2	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	71.2	----	70	130	----	----



Sub-Matrix: SOIL

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
					MS	MSD	Low	High	Value	Control Limit	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3117379) - continued</b>											
ES1322662-021	ML-MW24-0.2	EP074: Trichloroethene	79-01-6	2.5 mg/kg	77.1	----	70	130	----	----	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3117379)</b>											
ES1322662-021	ML-MW24-0.2	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	87.1	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3117380)</b>											
ES1322662-021	ML-MW24-0.2	EP080: C6 - C9 Fraction	----	32.5 mg/kg	77.5	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3117380)</b>											
ES1322662-021	ML-MW24-0.2	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	74.9	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3117380)</b>											
ES1322662-021	ML-MW24-0.2	EP080: Benzene	71-43-2	2.5 mg/kg	75.4	----	70	130	----	----	
		EP080: Toluene	108-88-3	2.5 mg/kg	84.6	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	78.4	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	87.9	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	87.3	----	70	130	----	----	
		EP080: Naphthalene	91-20-3	2.5 mg/kg	77.5	----	70	130	----	----	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3118935)</b>											
ES1322662-002	ML-SB50-0.1	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	95.6	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3119471)</b>											
ES1322662-021	ML-MW24-0.2	EP071: C10 - C14 Fraction	----	640 mg/kg	74.8	----	73	137	----	----	
		EP071: C15 - C28 Fraction	----	3140 mg/kg	75.3	----	53	131	----	----	
		EP071: C29 - C36 Fraction	----	2860 mg/kg	65.2	----	52	132	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3119471)</b>											
ES1322662-021	ML-MW24-0.2	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	94.6	----	73	137	----	----	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	69.1	----	53	131	----	----	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	53.6	----	52	132	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3119472)</b>											
ES1322662-021	ML-MW24-0.2	EP075(SIM): Phenol	108-95-2	10 mg/kg	90.3	----	70	130	----	----	
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	84.6	----	70	130	----	----	
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	77.7	----	60	130	----	----	
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	73.4	----	70	130	----	----	
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	65.2	----	20	130	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3119472)</b>											
ES1322662-021	ML-MW24-0.2	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	87.9	----	70	130	----	----	
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	82.4	----	70	130	----	----	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3120623)</b>											
ES1322620-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	108	----	70	130	----	----	
		EG005T: Cadmium	7440-43-9	50 mg/kg	106	----	70	130	----	----	





Sub-Matrix: SOIL

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>EG005T: Total Metals by ICP-AES (QCLot: 3120623) - continued</b>										
ES1322620-001	Anonymous	EG005T: Chromium	7440-47-3	50 mg/kg	111	----	70	130	----	----
		EG005T: Copper	7440-50-8	125 mg/kg	127	----	70	130	----	----
		EG005T: Lead	7439-92-1	125 mg/kg	114	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	108	----	70	130	----	----
		EG005T: Selenium	7782-49-2	50 mg/kg	106	----	70	130	----	----
		EG005T: Zinc	7440-66-6	125 mg/kg	112	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3120624)</b>										
ES1322620-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	110	----	70	130	----	----
<b>EG005T: Total Metals by ICP-AES (QCLot: 3120774)</b>										
ES1322662-001	MK-SB52-0.1	EG005T: Arsenic	7440-38-2	50 mg/kg	105	----	70	130	----	----
		EG005T: Cadmium	7440-43-9	50 mg/kg	103	----	70	130	----	----
		EG005T: Chromium	7440-47-3	50 mg/kg	104	----	70	130	----	----
		EG005T: Copper	7440-50-8	125 mg/kg	100	----	70	130	----	----
		EG005T: Lead	7439-92-1	125 mg/kg	106	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	105	----	70	130	----	----
		EG005T: Selenium	7782-49-2	50 mg/kg	105	----	70	130	----	----
		EG005T: Zinc	7440-66-6	125 mg/kg	108	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3120775)</b>										
ES1322662-001	MK-SB52-0.1	EG035T: Mercury	7439-97-6	5 mg/kg	113	----	70	130	----	----
<b>EG005T: Total Metals by ICP-AES (QCLot: 3120776)</b>										
ES1322662-021	ML-MW24-0.2	EG005T: Arsenic	7440-38-2	50 mg/kg	92.3	----	70	130	----	----
		EG005T: Cadmium	7440-43-9	50 mg/kg	102	----	70	130	----	----
		EG005T: Chromium	7440-47-3	50 mg/kg	106	----	70	130	----	----
		EG005T: Copper	7440-50-8	125 mg/kg	104	----	70	130	----	----
		EG005T: Lead	7439-92-1	125 mg/kg	101	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	115	----	70	130	----	----
		EG005T: Selenium	7782-49-2	50 mg/kg	97.3	----	70	130	----	----
		EG005T: Zinc	7440-66-6	125 mg/kg	105	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3120777)</b>										
ES1322662-021	ML-MW24-0.2	EG035T: Mercury	7439-97-6	5 mg/kg	105	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3123009)</b>										
ES1322662-001	MK-SB52-0.1	EP080: C6 - C9 Fraction	----	32.5 mg/kg	117	----	70	130	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3123009)</b>										
ES1322662-001	MK-SB52-0.1	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	115	----	70	130	----	----
<b>EP080: BTEXN (QCLot: 3123009)</b>										
ES1322662-001	MK-SB52-0.1	EP080: Benzene	71-43-2	2.5 mg/kg	100	----	70	130	----	----
		EP080: Toluene	108-88-3	2.5 mg/kg	102	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	107	----	70	130	----	----



Sub-Matrix: SOIL					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
						MS	MSD	Low	High	Value	Control Limit
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number								
<b>EP080: BTEXN (QCLot: 3123009) - continued</b>											
ES1322662-001	MK-SB52-0.1	EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	107	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	107	----	70	130	----	----	
		EP080: Naphthalene	91-20-3	2.5 mg/kg	96.7	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3123457)</b>											
ES1322662-001	MK-SB52-0.1	EP071: C10 - C14 Fraction	----	640 mg/kg	87.7	----	73	137	----	----	
		EP071: C15 - C28 Fraction	----	3140 mg/kg	85.0	----	53	131	----	----	
		EP071: C29 - C36 Fraction	----	2860 mg/kg	70.8	----	52	132	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3123457)</b>											
ES1322662-001	MK-SB52-0.1	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	109	----	73	137	----	----	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	77.3	----	53	131	----	----	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	72.4	----	52	132	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3123458)</b>											
ES1322662-001	MK-SB52-0.1	EP075(SIM): Phenol	108-95-2	10 mg/kg	84.7	----	70	130	----	----	
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	83.5	----	70	130	----	----	
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	72.8	----	60	130	----	----	
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	82.2	----	70	130	----	----	
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	68.0	----	20	130	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3123458)</b>											
ES1322662-001	MK-SB52-0.1	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	85.1	----	70	130	----	----	
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	91.8	----	70	130	----	----	

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1322662</b>	Page	: 1 of 13
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
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Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: 0287423 SYMPHONY	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: MT PIPER	Date Samples Received	: 18-OCT-2013
C-O-C number	: 11722-23-24	Issue Date	: 31-OCT-2013
Sampler	: GP	No. of samples received	: 57
Order number	: ----	No. of samples analysed	: 31
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EA055: Moisture Content</b>								
<b>Soil Glass Jar - Unpreserved (EA055-103)</b> MK-SB52-0.1, MK-SB16-1.5, MK-SB10-1.5	MK-SB50-0.1, D-141011-01-GP,	14-OCT-2013	----	----	----	23-OCT-2013	28-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EA055-103)</b> MK-SB59-0.2, MK-SB39-1.0, MK-SB31-0.2, MK-SB37-1.0, MK-SB56-0.2, MK-SB57-1.0,	MK-SB40-0.7, MK-SB32-0.1, MK-SB36-0.1, MK-SB38-0.5, MK-SB55-0.2, MK-SB68-0.5	15-OCT-2013	----	----	----	23-OCT-2013	29-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EA055-103)</b> MK-SB39-5.0, ML-MW24-0.2, ML-MW18-0.1, D01-161013-TS, MA-MW12-0.1, ML-MW12-0.1,	MK-SB68-4.0, ML-MW03-0.2, ML-MW05-0.5, ML-MW15-0.1, MA-MW07-0.1, ML-MW10-0.2	16-OCT-2013	----	----	----	23-OCT-2013	30-OCT-2013	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>							
<b>Snap Lock Bag (EA200)</b> MK-SB52-0.1, MK-SB16-1.5	MK-SB50-0.1, 14-OCT-2013	---	12-APR-2014	----	31-OCT-2013	29-APR-2014	✓
<b>Snap Lock Bag (EA200)</b> MK-SB59-0.2, MK-SB39-1.0, MK-SB31-0.2, MK-SB37-0.3, MK-SB55-0.2, MK-SB68-0.1	MK-SB40-0.7, MK-SB32-0.1, MK-SB36-0.1, MK-SB56-0.2, MK-SB57-1.0, 15-OCT-2013	---	13-APR-2014	----	31-OCT-2013	29-APR-2014	✓
<b>Snap Lock Bag (EA200)</b> ML-MW24-0.2, ML-MW18-0.1, ML-MW15-0.1, MA-MW07-0.1, ML-MW10-0.2	ML-MW03-0.2, ML-MW05-0.5, MA-MW12-0.1, ML-MW12-0.1, 16-OCT-2013	---	14-APR-2014	----	31-OCT-2013	29-APR-2014	✓
<b>EG005T: Total Metals by ICP-AES</b>							
<b>Soil Glass Jar - Unpreserved (EG005T)</b> MK-SB52-0.1, MK-SB16-1.5, MK-SB10-1.5	MK-SB50-0.1, D-141011-01-GP, 14-OCT-2013	23-OCT-2013	12-APR-2014	✓	23-OCT-2013	12-APR-2014	✓
<b>Soil Glass Jar - Unpreserved (EG005T)</b> MK-SB59-0.2, MK-SB39-1.0, MK-SB31-0.2, MK-SB37-1.0, MK-SB56-0.2, MK-SB57-1.0,	MK-SB40-0.7, MK-SB32-0.1, MK-SB36-0.1, MK-SB38-0.5, MK-SB55-0.2, MK-SB68-0.5, 15-OCT-2013	23-OCT-2013	13-APR-2014	✓	23-OCT-2013	13-APR-2014	✓
<b>Soil Glass Jar - Unpreserved (EG005T)</b> MK-SB39-5.0, ML-MW24-0.2, ML-MW18-0.1, D01-161013-TS, MA-MW12-0.1, ML-MW12-0.1,	MK-SB68-4.0, ML-MW03-0.2, ML-MW05-0.5, ML-MW15-0.1, MA-MW07-0.1, ML-MW10-0.2, 16-OCT-2013	23-OCT-2013	14-APR-2014	✓	23-OCT-2013	14-APR-2014	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
<b>Soil Glass Jar - Unpreserved (EG035T)</b> MK-SB52-0.1, MK-SB16-1.5, MK-SB10-1.5	MK-SB50-0.1, D-141011-01-GP,	14-OCT-2013	23-OCT-2013	11-NOV-2013	✓	24-OCT-2013	11-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EG035T)</b> MK-SB59-0.2, MK-SB39-1.0, MK-SB31-0.2, MK-SB37-1.0, MK-SB56-0.2, MK-SB57-1.0,	MK-SB40-0.7, MK-SB32-0.1, MK-SB36-0.1, MK-SB38-0.5, MK-SB55-0.2, MK-SB68-0.5	15-OCT-2013	23-OCT-2013	12-NOV-2013	✓	24-OCT-2013	12-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EG035T)</b> MK-SB39-5.0, ML-MW24-0.2, ML-MW18-0.1, D01-161013-TS, MA-MW12-0.1, ML-MW12-0.1,	MK-SB68-4.0, ML-MW03-0.2, ML-MW05-0.5, ML-MW15-0.1, MA-MW07-0.1, ML-MW10-0.2	16-OCT-2013	23-OCT-2013	13-NOV-2013	✓	24-OCT-2013	13-NOV-2013	✓
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
<b>Soil Glass Jar - Unpreserved (EP066)</b> MK-SB50-0.1,	MK-SB16-1.5	14-OCT-2013	22-OCT-2013	28-OCT-2013	✓	23-OCT-2013	01-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP066)</b> MK-SB38-0.5,	MK-SB57-1.0	15-OCT-2013	22-OCT-2013	29-OCT-2013	✓	23-OCT-2013	01-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP066)</b> MK-SB39-5.0, ML-MW24-0.2, ML-MW18-0.1, D01-161013-TS, MA-MW12-0.1, ML-MW12-0.1,	MK-SB68-4.0, ML-MW03-0.2, ML-MW05-0.5, ML-MW15-0.1, MA-MW07-0.1, ML-MW10-0.2	16-OCT-2013	22-OCT-2013	30-OCT-2013	✓	23-OCT-2013	01-DEC-2013	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP071)</b> MK-SB52-0.1, MK-SB16-1.5, MK-SB10-1.5	MK-SB50-0.1, D-141011-01-GP,	14-OCT-2013	25-OCT-2013	28-OCT-2013	✓	25-OCT-2013	04-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP071)</b> MK-SB59-0.2, MK-SB39-1.0, MK-SB31-0.2, MK-SB37-1.0, MK-SB56-0.2, MK-SB57-1.0,	MK-SB40-0.7, MK-SB32-0.1, MK-SB36-0.1, MK-SB38-0.5, MK-SB55-0.2, MK-SB68-0.5	15-OCT-2013	25-OCT-2013	29-OCT-2013	✓	25-OCT-2013	04-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP071)</b> ML-MW24-0.2, ML-MW18-0.1, D01-161013-TS, MA-MW12-0.1, ML-MW12-0.1,	ML-MW03-0.2, ML-MW05-0.5, ML-MW15-0.1, MA-MW07-0.1, ML-MW10-0.2	16-OCT-2013	24-OCT-2013	30-OCT-2013	✓	24-OCT-2013	03-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP071)</b> MK-SB39-5.0,	MK-SB68-4.0	16-OCT-2013	25-OCT-2013	30-OCT-2013	✓	25-OCT-2013	04-DEC-2013	✓
<b>EP074D: Fumigants</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK-SB50-0.1,	MK-SB16-1.5	14-OCT-2013	21-OCT-2013	21-OCT-2013	✓	21-OCT-2013	21-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK-SB38-0.5,	MK-SB57-1.0	15-OCT-2013	21-OCT-2013	22-OCT-2013	✓	21-OCT-2013	22-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK-SB39-5.0, ML-MW24-0.2, ML-MW18-0.1, D01-161013-TS, MA-MW12-0.1, ML-MW12-0.1,	MK-SB68-4.0, ML-MW03-0.2, ML-MW05-0.5, ML-MW15-0.1, MA-MW07-0.1, ML-MW10-0.2	16-OCT-2013	21-OCT-2013	23-OCT-2013	✓	21-OCT-2013	23-OCT-2013	✓
<b>EP074E: Halogenated Aliphatic Compounds</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK-SB50-0.1,	MK-SB16-1.5	14-OCT-2013	21-OCT-2013	21-OCT-2013	✓	21-OCT-2013	21-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK-SB38-0.5,	MK-SB57-1.0	15-OCT-2013	21-OCT-2013	22-OCT-2013	✓	21-OCT-2013	22-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK-SB39-5.0, ML-MW24-0.2, ML-MW18-0.1, D01-161013-TS, MA-MW12-0.1, ML-MW12-0.1,	MK-SB68-4.0, ML-MW03-0.2, ML-MW05-0.5, ML-MW15-0.1, MA-MW07-0.1, ML-MW10-0.2	16-OCT-2013	21-OCT-2013	23-OCT-2013	✓	21-OCT-2013	23-OCT-2013	✓





Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP074F: Halogenated Aromatic Compounds</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK-SB50-0.1,	MK-SB16-1.5	14-OCT-2013	21-OCT-2013	21-OCT-2013	✓	21-OCT-2013	21-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK-SB38-0.5,	MK-SB57-1.0	15-OCT-2013	21-OCT-2013	22-OCT-2013	✓	21-OCT-2013	22-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK-SB39-5.0, ML-MW24-0.2, ML-MW18-0.1, D01-161013-TS, MA-MW12-0.1, ML-MW12-0.1,	MK-SB68-4.0, ML-MW03-0.2, ML-MW05-0.5, ML-MW15-0.1, MA-MW07-0.1, ML-MW10-0.2	16-OCT-2013	21-OCT-2013	23-OCT-2013	✓	21-OCT-2013	23-OCT-2013	✓
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK-SB50-0.1,	MK-SB16-1.5	14-OCT-2013	21-OCT-2013	21-OCT-2013	✓	21-OCT-2013	21-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK-SB38-0.5,	MK-SB57-1.0	15-OCT-2013	21-OCT-2013	22-OCT-2013	✓	21-OCT-2013	22-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK-SB39-5.0, ML-MW24-0.2, ML-MW18-0.1, D01-161013-TS, MA-MW12-0.1, ML-MW12-0.1,	MK-SB68-4.0, ML-MW03-0.2, ML-MW05-0.5, ML-MW15-0.1, MA-MW07-0.1, ML-MW10-0.2	16-OCT-2013	21-OCT-2013	23-OCT-2013	✓	21-OCT-2013	23-OCT-2013	✓
<b>EP074H: Naphthalene</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK-SB50-0.1,	MK-SB16-1.5	14-OCT-2013	21-OCT-2013	21-OCT-2013	✓	21-OCT-2013	21-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK-SB38-0.5,	MK-SB57-1.0	15-OCT-2013	21-OCT-2013	22-OCT-2013	✓	21-OCT-2013	22-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK-SB39-5.0, ML-MW24-0.2, ML-MW18-0.1, D01-161013-TS, MA-MW12-0.1, ML-MW12-0.1,	MK-SB68-4.0, ML-MW03-0.2, ML-MW05-0.5, ML-MW15-0.1, MA-MW07-0.1, ML-MW10-0.2	16-OCT-2013	21-OCT-2013	23-OCT-2013	✓	21-OCT-2013	23-OCT-2013	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP074B: Oxygenated Compounds</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK-SB50-0.1,	MK-SB16-1.5	14-OCT-2013	21-OCT-2013	21-OCT-2013	✓	21-OCT-2013	21-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK-SB38-0.5,	MK-SB57-1.0	15-OCT-2013	21-OCT-2013	22-OCT-2013	✓	21-OCT-2013	22-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK-SB39-5.0, ML-MW24-0.2, ML-MW18-0.1, D01-161013-TS, MA-MW12-0.1, ML-MW12-0.1,	MK-SB68-4.0, ML-MW03-0.2, ML-MW05-0.5, ML-MW15-0.1, MA-MW07-0.1, ML-MW10-0.2	16-OCT-2013	21-OCT-2013	23-OCT-2013	✓	21-OCT-2013	23-OCT-2013	✓
<b>EP074C: Sulfonated Compounds</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK-SB50-0.1,	MK-SB16-1.5	14-OCT-2013	21-OCT-2013	21-OCT-2013	✓	21-OCT-2013	21-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK-SB38-0.5,	MK-SB57-1.0	15-OCT-2013	21-OCT-2013	22-OCT-2013	✓	21-OCT-2013	22-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK-SB39-5.0, ML-MW24-0.2, ML-MW18-0.1, D01-161013-TS, MA-MW12-0.1, ML-MW12-0.1,	MK-SB68-4.0, ML-MW03-0.2, ML-MW05-0.5, ML-MW15-0.1, MA-MW07-0.1, ML-MW10-0.2	16-OCT-2013	21-OCT-2013	23-OCT-2013	✓	21-OCT-2013	23-OCT-2013	✓
<b>EP074G: Trihalomethanes</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK-SB50-0.1,	MK-SB16-1.5	14-OCT-2013	21-OCT-2013	21-OCT-2013	✓	21-OCT-2013	21-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK-SB38-0.5,	MK-SB57-1.0	15-OCT-2013	21-OCT-2013	22-OCT-2013	✓	21-OCT-2013	22-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK-SB39-5.0, ML-MW24-0.2, ML-MW18-0.1, D01-161013-TS, MA-MW12-0.1, ML-MW12-0.1,	MK-SB68-4.0, ML-MW03-0.2, ML-MW05-0.5, ML-MW15-0.1, MA-MW07-0.1, ML-MW10-0.2	16-OCT-2013	21-OCT-2013	23-OCT-2013	✓	21-OCT-2013	23-OCT-2013	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP075(SIM)A: Phenolic Compounds</b>								
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MK-SB52-0.1, MK-SB16-1.5, MK-SB10-1.5	MK-SB50-0.1, D-141011-01-GP,	14-OCT-2013	25-OCT-2013	28-OCT-2013	✓	25-OCT-2013	04-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MK-SB59-0.2, MK-SB39-1.0, MK-SB31-0.2, MK-SB37-1.0, MK-SB56-0.2, MK-SB57-1.0,	MK-SB40-0.7, MK-SB32-0.1, MK-SB36-0.1, MK-SB38-0.5, MK-SB55-0.2, MK-SB68-0.5	15-OCT-2013	25-OCT-2013	29-OCT-2013	✓	25-OCT-2013	04-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> ML-MW24-0.2, ML-MW18-0.1, D01-161013-TS, MA-MW12-0.1, ML-MW12-0.1,	ML-MW03-0.2, ML-MW05-0.5, ML-MW15-0.1, MA-MW07-0.1, ML-MW10-0.2	16-OCT-2013	24-OCT-2013	30-OCT-2013	✓	25-OCT-2013	03-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MK-SB39-5.0,	MK-SB68-4.0	16-OCT-2013	25-OCT-2013	30-OCT-2013	✓	25-OCT-2013	04-DEC-2013	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MK-SB52-0.1, MK-SB16-1.5, MK-SB10-1.5	MK-SB50-0.1, D-141011-01-GP,	14-OCT-2013	25-OCT-2013	28-OCT-2013	✓	25-OCT-2013	04-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MK-SB59-0.2, MK-SB39-1.0, MK-SB31-0.2, MK-SB37-1.0, MK-SB56-0.2, MK-SB57-1.0,	MK-SB40-0.7, MK-SB32-0.1, MK-SB36-0.1, MK-SB38-0.5, MK-SB55-0.2, MK-SB68-0.5	15-OCT-2013	25-OCT-2013	29-OCT-2013	✓	25-OCT-2013	04-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> ML-MW24-0.2, ML-MW18-0.1, D01-161013-TS, MA-MW12-0.1, ML-MW12-0.1,	ML-MW03-0.2, ML-MW05-0.5, ML-MW15-0.1, MA-MW07-0.1, ML-MW10-0.2	16-OCT-2013	24-OCT-2013	30-OCT-2013	✓	25-OCT-2013	03-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MK-SB39-5.0,	MK-SB68-4.0	16-OCT-2013	25-OCT-2013	30-OCT-2013	✓	25-OCT-2013	04-DEC-2013	✓



Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP080: BTEXN</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK-SB52-0.1, MK-SB16-1.5, MK-SB10-1.5	MK-SB50-0.1, D-141011-01-GP,	14-OCT-2013	24-OCT-2013	28-OCT-2013	✓	25-OCT-2013	28-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK-SB59-0.2, MK-SB39-1.0, MK-SB31-0.2, MK-SB37-1.0, MK-SB56-0.2, MK-SB57-1.0,	MK-SB40-0.7, MK-SB32-0.1, MK-SB36-0.1, MK-SB38-0.5, MK-SB55-0.2, MK-SB68-0.5	15-OCT-2013	24-OCT-2013	29-OCT-2013	✓	25-OCT-2013	29-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> ML-MW24-0.2, ML-MW18-0.1, D01-161013-TS, MA-MW12-0.1, ML-MW12-0.1,	ML-MW03-0.2, ML-MW05-0.5, ML-MW15-0.1, MA-MW07-0.1, ML-MW10-0.2	16-OCT-2013	21-OCT-2013	30-OCT-2013	✓	21-OCT-2013	30-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK-SB39-5.0,	MK-SB68-4.0	16-OCT-2013	24-OCT-2013	30-OCT-2013	✓	25-OCT-2013	30-OCT-2013	✓
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK-SB52-0.1, MK-SB16-1.5, MK-SB10-1.5	MK-SB50-0.1, D-141011-01-GP,	14-OCT-2013	24-OCT-2013	28-OCT-2013	✓	25-OCT-2013	28-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK-SB59-0.2, MK-SB39-1.0, MK-SB31-0.2, MK-SB37-1.0, MK-SB56-0.2, MK-SB57-1.0,	MK-SB40-0.7, MK-SB32-0.1, MK-SB36-0.1, MK-SB38-0.5, MK-SB55-0.2, MK-SB68-0.5	15-OCT-2013	24-OCT-2013	29-OCT-2013	✓	25-OCT-2013	29-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> ML-MW24-0.2, ML-MW18-0.1, D01-161013-TS, MA-MW12-0.1, ML-MW12-0.1,	ML-MW03-0.2, ML-MW05-0.5, ML-MW15-0.1, MA-MW07-0.1, ML-MW10-0.2	16-OCT-2013	21-OCT-2013	30-OCT-2013	✓	21-OCT-2013	30-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK-SB39-5.0,	MK-SB68-4.0	16-OCT-2013	24-OCT-2013	30-OCT-2013	✓	25-OCT-2013	30-OCT-2013	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Moisture Content	EA055-103	4	40	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	4	37	10.8	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	2	16	12.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	4	39	10.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	6	58	10.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	4	40	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	4	33	12.1	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	2	37	5.4	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	16	6.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	3	46	6.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	3	58	5.2	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	33	6.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
PAH/Phenols (SIM)	EP075(SIM)	2	37	5.4	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	16	6.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	3	46	6.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	3	58	5.2	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	33	6.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	2	37	5.4	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	16	6.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	3	46	6.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	3	58	5.2	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	33	6.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Asbestos Identification in bulk solids	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (2013) Schedule B(3) (Method 506.1)
Volatile Organic Compounds	EP074	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option A - Concentrating)	ORG17A	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

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Client : ENVIRO RESOURCES MANAGEMENT  
Project : 0287423 SYMPHONY



<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.





## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Laboratory Control Spike (LCS) Recoveries</b>							
EP074B: Oxygenated Compounds	3717251-002	----	Vinyl Acetate	108-05-4	26.9 %	29.6-156%	Recovery less than lower control limit

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Matrix Spike outliers occur.

#### Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- No Analysis Holding Time Outliers exist.

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

<b>Work Order</b>	: <b>ES1322662</b>		
<b>Client</b>	: <b>ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact Address</b>	: MR JONATHAN LEKAWSKI GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Contact Address</b>	: Barbara Hanna 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: jonathan.lekawski@erm.com	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: 0287423 SYMPHONY	<b>Page</b>	: 1 of 4
<b>Order number</b>	: ----		
<b>C-O-C number</b>	: 11722-23-24	<b>Quote number</b>	: ES2013ENVRES0370 (SY/278/13 V3)
<b>Site</b>	: MT PIPER		
<b>Sampler</b>	: GP	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement

#### Dates

<b>Date Samples Received</b>	: 18-OCT-2013	<b>Issue Date</b>	: 21-OCT-2013 15:32
<b>Client Requested Due Date</b>	: 25-OCT-2013	<b>Scheduled Reporting Date</b>	: <b>25-OCT-2013</b>

#### Delivery Details

<b>Mode of Delivery</b>	: Pickup	<b>Temperature</b>	: 7.9°C - Ice present
<b>No. of coolers/boxes</b>	: 3 HARD	<b>No. of samples received</b>	: 57
<b>Security Seal</b>	: N/A	<b>No. of samples analysed</b>	: 31

#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Samples received in appropriately pretreated and preserved containers.
- Samples D\_151013\_01\_GP and T\_151013\_01\_GP were not received.
- Analysis not indicated for sample MK\_SB14\_3.0, samples to be held until further notice.
- Sample T\_141011\_01\_GP to be forwarded to Envirolab.
- **Samples received in appropriately pretreated and preserved containers.**
- **Asbestos analysis will be conducted by ALS Newcastle.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- No sample container / preservation non-compliance exist.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: SOIL

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA200 Asbestos Identification in Soils	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP066 (solids) Polychlorinated Biphenyls by GCMS	SOIL - EP074 (solids) Volatile Organic Compounds	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-27 TRH/TEXN/PAH/Phenols/8Metals
ES1322662-001	14-OCT-2013 15:00	MK-SB52-0.1		✓	✓			✓	
ES1322662-002	14-OCT-2013 15:00	MK-SB50-0.1		✓	✓	✓	✓	✓	
ES1322662-003	14-OCT-2013 15:00	MK-SB16-1.5		✓	✓	✓	✓	✓	
ES1322662-004	14-OCT-2013 15:00	D-141011-01-GP			✓			✓	
ES1322662-005	15-OCT-2013 15:00	MK-SB59-0.2		✓	✓			✓	
ES1322662-006	15-OCT-2013 15:00	MK-SB40-0.7		✓	✓			✓	
ES1322662-007	15-OCT-2013 15:00	MK-SB39-1.0		✓	✓			✓	
ES1322662-008	15-OCT-2013 15:00	MK-SB32-0.1		✓	✓			✓	
ES1322662-009	15-OCT-2013 15:00	MK-SB31-0.2		✓	✓			✓	
ES1322662-010	15-OCT-2013 15:00	MK-SB36-0.1		✓	✓			✓	
ES1322662-011	15-OCT-2013 15:00	MK-SB37-0.3		✓					
ES1322662-012	15-OCT-2013 15:00	MK-SB37-1.0			✓			✓	
ES1322662-013	15-OCT-2013 15:00	MK-SB38-0.5			✓	✓	✓	✓	
ES1322662-014	15-OCT-2013 15:00	MK-SB56-0.2		✓	✓			✓	
ES1322662-015	15-OCT-2013 15:00	MK-SB55-0.2		✓	✓			✓	
ES1322662-016	15-OCT-2013 15:00	MK-SB57-1.0		✓	✓	✓	✓	✓	
ES1322662-017	15-OCT-2013 15:00	MK-SB68-0.1		✓					
ES1322662-018	15-OCT-2013 15:00	MK-SB68-0.5			✓			✓	
ES1322662-019	16-OCT-2013 15:00	MK-SB39-5.0			✓	✓	✓	✓	
ES1322662-020	16-OCT-2013 15:00	MK-SB68-4.0			✓	✓	✓	✓	
ES1322662-021	16-OCT-2013 15:00	ML-MW24-0.2		✓	✓	✓	✓		✓
ES1322662-022	16-OCT-2013 15:00	ML-MW03-0.2		✓	✓	✓	✓		✓
ES1322662-023	16-OCT-2013 15:00	ML-MW18-0.1		✓	✓	✓	✓		✓
ES1322662-024	16-OCT-2013 15:00	ML-MW05-0.5		✓	✓	✓	✓		✓
ES1322662-025	16-OCT-2013 15:00	D01-161013-TS		✓	✓	✓	✓		✓
ES1322662-026	16-OCT-2013 15:00	ML-MW15-0.1		✓	✓	✓	✓		✓
ES1322662-027	16-OCT-2013 15:00	MA-MW12-0.1		✓	✓	✓	✓		✓
ES1322662-028	16-OCT-2013 15:00	MA-MW07-0.1		✓	✓	✓	✓		✓
ES1322662-029	16-OCT-2013 15:00	ML-MW12-0.1		✓	✓	✓	✓		✓
ES1322662-030	16-OCT-2013 15:00	ML-MW10-0.2		✓	✓	✓	✓		✓
ES1322662-031	14-OCT-2013 15:00	MK-SB10-1.5			✓			✓	
ES1322662-032	14-OCT-2013 15:00	MK-SB50-0.35	✓						
ES1322662-033	14-OCT-2013 15:00	MK-SB16-5.0	✓						
ES1322662-034	14-OCT-2013 15:00	MK-SB16-8.0	✓						
ES1322662-035	15-OCT-2013 15:00	MK-SB40-0.1	✓						



			(On Hold) SOIL No analysis requested	SOIL - EA200	Asbestos Identification in Soils	SOIL - EG005T (solids)	Total Metals by ICP-AES	SOIL - EP066 (solids)	Polychlorinated Biphenyls by GCMS	SOIL - EP074 (solids)	Volatile Organic Compounds	SOIL - S-02	8 Metals (incl. Digestion)	SOIL - S-27	TRH/TEXN/PAH/Phenols/8Metals
ES1322662-036	15-OCT-2013 15:00	MK-SB39-0.2	✓												
ES1322662-037	15-OCT-2013 15:00	MK-SB39-0.5	✓												
ES1322662-038	15-OCT-2013 15:00	MK-SB37-0.5	✓												
ES1322662-039	15-OCT-2013 15:00	MK-SB38-0.3	✓												
ES1322662-040	15-OCT-2013 15:00	MK-SB56-0.5	✓												
ES1322662-041	15-OCT-2013 15:00	D-151013-01-GP	✓												
ES1322662-042	15-OCT-2013 15:00	T-151010-01-GP	✓												
ES1322662-043	16-OCT-2013 15:00	MK-SB14-3.0	✓												
ES1322662-044	16-OCT-2013 15:00	MK-SB39-1.5	✓												
ES1322662-045	16-OCT-2013 15:00	MK-SB39-2.0	✓												
ES1322662-046	16-OCT-2013 15:00	MK-SB39-3.0	✓												
ES1322662-047	16-OCT-2013 15:00	MK-SB39-4.0	✓												
ES1322662-048	16-OCT-2013 15:00	MK-SB39-5.9	✓												
ES1322662-049	16-OCT-2013 15:00	MK-SB68-1.5	✓												
ES1322662-050	16-OCT-2013 15:00	MK-SB68-2.0	✓												
ES1322662-051	16-OCT-2013 15:00	MK-SB68-3.0	✓												
ES1322662-052	16-OCT-2013 15:00	MK-SB68-5.0	✓												
ES1322662-053	16-OCT-2013 15:00	MK-SB68-6.0	✓												
ES1322662-054	16-OCT-2013 15:00	ML-MW03-0.5	✓												
ES1322662-055	16-OCT-2013 15:00	ML-MW05-0.1	✓												
ES1322662-058	14-OCT-2013 15:00	MK-SB14-1.5	✓												
ES1322662-059	14-OCT-2013 15:00	MK-SB14-2.0	✓												

### Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
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Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

<b>Work Order</b>	: <b>ES1322662</b>		
<b>Client</b>	: <b>ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact Address</b>	: MR JONATHAN LEKAWSKI GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Contact Address</b>	: Barbara Hanna 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: jonathan.lekawski@erm.com	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: 0287423 SYMPHONY	<b>Page</b>	: 1 of 4
<b>Order number</b>	: ----		
<b>C-O-C number</b>	: 11722-23-24	<b>Quote number</b>	: ES2013ENVRES0370 (SY/278/13 V3)
<b>Site</b>	: MT PIPER		
<b>Sampler</b>	: GP	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement

#### Dates

Date Samples Received	: 18-OCT-2013	Issue Date	: 24-OCT-2013 09:18
Client Requested Due Date	: 29-OCT-2013	Scheduled Reporting Date	: <b>29-OCT-2013</b>

#### Delivery Details

Mode of Delivery	: Pickup	Temperature	: 7.9°C - Ice present
No. of coolers/boxes	: 3 HARD	No. of samples received	: 57
Security Seal	: N/A	No. of samples analysed	: 31

#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Samples received in appropriately pretreated and preserved containers.
- Samples D\_151013\_01\_GP and T\_151013\_01\_GP were not received.
- Analysis not indicated for sample MK\_SB14\_3.0, samples to be held until further notice.
- Sample T\_141011\_01\_GP to be forwarded to Envirolab.
- **Samples received in appropriately pretreated and preserved containers.**
- **Asbestos analysis will be conducted by ALS Newcastle.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- No sample container / preservation non-compliance exist.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: SOIL

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA200 Asbestos Identification in Soils	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP066 (solids) Polychlorinated Biphenyls by GCMS	SOIL - EP074 (solids) Volatile Organic Compounds	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-24 TRH/IB/TEXN/PAH + Phenols	SOIL - S-27 TRH/IB/TEXN/PAH/Phenols/8Metals
ES1322662-001	14-OCT-2013 15:00	MK-SB52-0.1		✓	✓			✓	✓	
ES1322662-002	14-OCT-2013 15:00	MK-SB50-0.1		✓	✓	✓	✓	✓	✓	
ES1322662-003	14-OCT-2013 15:00	MK-SB16-1.5		✓	✓	✓	✓	✓	✓	
ES1322662-004	14-OCT-2013 15:00	D-141011-01-GP			✓			✓	✓	
ES1322662-005	15-OCT-2013 15:00	MK-SB59-0.2		✓	✓			✓	✓	
ES1322662-006	15-OCT-2013 15:00	MK-SB40-0.7		✓	✓			✓	✓	
ES1322662-007	15-OCT-2013 15:00	MK-SB39-1.0		✓	✓			✓	✓	
ES1322662-008	15-OCT-2013 15:00	MK-SB32-0.1		✓	✓			✓	✓	
ES1322662-009	15-OCT-2013 15:00	MK-SB31-0.2		✓	✓			✓	✓	
ES1322662-010	15-OCT-2013 15:00	MK-SB36-0.1		✓	✓			✓	✓	
ES1322662-011	15-OCT-2013 15:00	MK-SB37-0.3		✓						
ES1322662-012	15-OCT-2013 15:00	MK-SB37-1.0			✓			✓	✓	
ES1322662-013	15-OCT-2013 15:00	MK-SB38-0.5			✓	✓	✓	✓	✓	
ES1322662-014	15-OCT-2013 15:00	MK-SB56-0.2		✓	✓			✓	✓	
ES1322662-015	15-OCT-2013 15:00	MK-SB55-0.2		✓	✓			✓	✓	
ES1322662-016	15-OCT-2013 15:00	MK-SB57-1.0		✓	✓	✓	✓	✓	✓	
ES1322662-017	15-OCT-2013 15:00	MK-SB68-0.1		✓						
ES1322662-018	15-OCT-2013 15:00	MK-SB68-0.5			✓			✓	✓	
ES1322662-019	16-OCT-2013 15:00	MK-SB39-5.0			✓	✓	✓	✓	✓	
ES1322662-020	16-OCT-2013 15:00	MK-SB68-4.0			✓	✓	✓	✓	✓	
ES1322662-021	16-OCT-2013 15:00	ML-MW24-0.2		✓	✓	✓	✓			✓
ES1322662-022	16-OCT-2013 15:00	ML-MW03-0.2		✓	✓	✓	✓			✓
ES1322662-023	16-OCT-2013 15:00	ML-MW18-0.1		✓	✓	✓	✓			✓
ES1322662-024	16-OCT-2013 15:00	ML-MW05-0.5		✓	✓	✓	✓			✓
ES1322662-025	16-OCT-2013 15:00	D01-161013-TS		✓	✓	✓	✓			✓
ES1322662-026	16-OCT-2013 15:00	ML-MW15-0.1		✓	✓	✓	✓			✓
ES1322662-027	16-OCT-2013 15:00	MA-MW12-0.1		✓	✓	✓	✓			✓
ES1322662-028	16-OCT-2013 15:00	MA-MW07-0.1		✓	✓	✓	✓			✓
ES1322662-029	16-OCT-2013 15:00	ML-MW12-0.1		✓	✓	✓	✓			✓
ES1322662-030	16-OCT-2013 15:00	ML-MW10-0.2		✓	✓	✓	✓			✓
ES1322662-031	14-OCT-2013 15:00	MK-SB10-1.5			✓			✓	✓	
ES1322662-032	14-OCT-2013 15:00	MK-SB50-0.35	✓							
ES1322662-033	14-OCT-2013 15:00	MK-SB16-5.0	✓							
ES1322662-034	14-OCT-2013 15:00	MK-SB16-8.0	✓							
ES1322662-035	15-OCT-2013 15:00	MK-SB40-0.1	✓							





			(On Hold) SOIL No analysis requested	SOIL - EA200	Asbestos Identification in Soils	SOIL - EG005T (solids)	Total Metals by ICP-AES	SOIL - EP066 (solids)	Polychlorinated Biphenyls by GCMS	SOIL - EP074 (solids)	Volatile Organic Compounds	SOIL - S-02	8 Metals (incl. Digestion)	SOIL - S-24	TRH/BTEXN/PAH + Phenols	SOIL - S-27	TRH/BTEXN/PAH/Phenols/8Metals
ES1322662-036	15-OCT-2013 15:00	MK-SB39-0.2	✓														
ES1322662-037	15-OCT-2013 15:00	MK-SB39-0.5	✓														
ES1322662-038	15-OCT-2013 15:00	MK-SB37-0.5	✓														
ES1322662-039	15-OCT-2013 15:00	MK-SB38-0.3	✓														
ES1322662-040	15-OCT-2013 15:00	MK-SB56-0.5	✓														
ES1322662-041	15-OCT-2013 15:00	D-151013-01-GP	✓														
ES1322662-042	15-OCT-2013 15:00	T-151010-01-GP	✓														
ES1322662-043	16-OCT-2013 15:00	MK-SB14-3.0	✓														
ES1322662-044	16-OCT-2013 15:00	MK-SB39-1.5	✓														
ES1322662-045	16-OCT-2013 15:00	MK-SB39-2.0	✓														
ES1322662-046	16-OCT-2013 15:00	MK-SB39-3.0	✓														
ES1322662-047	16-OCT-2013 15:00	MK-SB39-4.0	✓														
ES1322662-048	16-OCT-2013 15:00	MK-SB39-5.9	✓														
ES1322662-049	16-OCT-2013 15:00	MK-SB68-1.5	✓														
ES1322662-050	16-OCT-2013 15:00	MK-SB68-2.0	✓														
ES1322662-051	16-OCT-2013 15:00	MK-SB68-3.0	✓														
ES1322662-052	16-OCT-2013 15:00	MK-SB68-5.0	✓														
ES1322662-053	16-OCT-2013 15:00	MK-SB68-6.0	✓														
ES1322662-054	16-OCT-2013 15:00	ML-MW03-0.5	✓														
ES1322662-055	16-OCT-2013 15:00	ML-MW05-0.1	✓														
ES1322662-058	14-OCT-2013 15:00	MK-SB14-1.5	✓														
ES1322662-059	14-OCT-2013 15:00	MK-SB14-2.0	✓														

### Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
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Email jonathan.lekawski@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
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Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

<b>Work Order</b>	: <b>ES1322662</b>		
<b>Client</b>	: <b>ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact Address</b>	: MR JONATHAN LEKAWSKI GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Contact Address</b>	: Barbara Hanna 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: jonathan.lekawski@erm.com	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: 0287423 SYMPHONY	<b>Page</b>	: 1 of 4
<b>Order number</b>	: ----		
<b>C-O-C number</b>	: 11722-23-24	<b>Quote number</b>	: ES2013ENVRES0370 (SY/278/13 V3)
<b>Site</b>	: MT PIPER		
<b>Sampler</b>	: GP	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement

#### Dates

Date Samples Received : 18-OCT-2013	Issue Date : 25-OCT-2013 14:09
Client Requested Due Date : 29-OCT-2013	Scheduled Reporting Date : <b>29-OCT-2013</b>

#### Delivery Details

Mode of Delivery : Pickup	Temperature : 7.9°C - Ice present
No. of coolers/boxes : 3 HARD	No. of samples received : 57
Security Seal : N/A	No. of samples analysed : 31

#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Samples received in appropriately pretreated and preserved containers.
- Samples D\_151013\_01\_GP and T\_151013\_01\_GP were not received.
- Analysis not indicated for sample MK\_SB14\_3.0, samples to be held until further notice.
- Sample T\_141011\_01\_GP to be forwarded to Envirolab.
- **Samples received in appropriately pretreated and preserved containers.**
- **Asbestos analysis will be conducted by ALS Newcastle.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- No sample container / preservation non-compliance exist.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA200 Asbestos Identification in Soils	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP066 (solids) Polychlorinated Biphenyls by GCMS	SOIL - EP074 (solids) Volatile Organic Compounds	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-24 TRH/TEXN/PAH + Phenols	SOIL - S-27 TRH/TEXN/PAH/Phenols/8Metals
ES1322662-001	14-OCT-2013 15:00	MK-SB52-0.1		✓	✓			✓	✓	
ES1322662-002	14-OCT-2013 15:00	MK-SB50-0.1		✓	✓	✓	✓	✓	✓	
ES1322662-003	14-OCT-2013 15:00	MK-SB16-1.5		✓	✓	✓	✓	✓	✓	
ES1322662-004	14-OCT-2013 15:00	D-141011-01-GP			✓			✓	✓	
ES1322662-005	15-OCT-2013 15:00	MK-SB59-0.2		✓	✓			✓	✓	
ES1322662-006	15-OCT-2013 15:00	MK-SB40-0.7		✓	✓			✓	✓	
ES1322662-007	15-OCT-2013 15:00	MK-SB39-1.0		✓	✓			✓	✓	
ES1322662-008	15-OCT-2013 15:00	MK-SB32-0.1		✓	✓			✓	✓	
ES1322662-009	15-OCT-2013 15:00	MK-SB31-0.2		✓	✓			✓	✓	
ES1322662-010	15-OCT-2013 15:00	MK-SB36-0.1		✓	✓			✓	✓	
ES1322662-011	15-OCT-2013 15:00	MK-SB37-0.3		✓						
ES1322662-012	15-OCT-2013 15:00	MK-SB37-1.0			✓			✓	✓	
ES1322662-013	15-OCT-2013 15:00	MK-SB38-0.5			✓	✓	✓	✓	✓	
ES1322662-014	15-OCT-2013 15:00	MK-SB56-0.2		✓	✓			✓	✓	
ES1322662-015	15-OCT-2013 15:00	MK-SB55-0.2		✓	✓			✓	✓	
ES1322662-016	15-OCT-2013 15:00	MK-SB57-1.0		✓	✓	✓	✓	✓	✓	
ES1322662-017	15-OCT-2013 15:00	MK-SB68-0.1		✓						
ES1322662-018	15-OCT-2013 15:00	MK-SB68-0.5			✓			✓	✓	
ES1322662-019	16-OCT-2013 15:00	MK-SB39-5.0			✓	✓	✓	✓	✓	
ES1322662-020	16-OCT-2013 15:00	MK-SB68-4.0			✓	✓	✓	✓	✓	
ES1322662-021	16-OCT-2013 15:00	ML-MW24-0.2		✓	✓	✓	✓			✓
ES1322662-022	16-OCT-2013 15:00	ML-MW03-0.2		✓	✓	✓	✓			✓
ES1322662-023	16-OCT-2013 15:00	ML-MW18-0.1		✓	✓	✓	✓			✓
ES1322662-024	16-OCT-2013 15:00	ML-MW05-0.5		✓	✓	✓	✓			✓
ES1322662-025	16-OCT-2013 15:00	D01-161013-TS			✓	✓	✓			✓
ES1322662-026	16-OCT-2013 15:00	ML-MW15-0.1		✓	✓	✓	✓			✓
ES1322662-027	16-OCT-2013 15:00	MA-MW12-0.1		✓	✓	✓	✓			✓
ES1322662-028	16-OCT-2013 15:00	MA-MW07-0.1		✓	✓	✓	✓			✓
ES1322662-029	16-OCT-2013 15:00	ML-MW12-0.1		✓	✓	✓	✓			✓
ES1322662-030	16-OCT-2013 15:00	ML-MW10-0.2		✓	✓	✓	✓			✓
ES1322662-031	14-OCT-2013 15:00	MK-SB10-1.5			✓			✓	✓	
ES1322662-032	14-OCT-2013 15:00	MK-SB50-0.35	✓							
ES1322662-033	14-OCT-2013 15:00	MK-SB16-5.0	✓							
ES1322662-034	14-OCT-2013 15:00	MK-SB16-8.0	✓							
ES1322662-035	15-OCT-2013 15:00	MK-SB40-0.1	✓							



			(On Hold) SOIL No analysis requested	SOIL - EA200	Asbestos Identification in Soils	SOIL - EG005T (solids)	Total Metals by ICP-AES	SOIL - EP066 (solids)	Polychlorinated Biphenyls by GCMS	SOIL - EP074 (solids)	Volatile Organic Compounds	SOIL - S-02	8 Metals (incl. Digestion)	SOIL - S-24	TRH/BTEXN/PAH + Phenols	SOIL - S-27	TRH/BTEXN/PAH/Phenols/8Metals
ES1322662-036	15-OCT-2013 15:00	MK-SB39-0.2	✓														
ES1322662-037	15-OCT-2013 15:00	MK-SB39-0.5	✓														
ES1322662-038	15-OCT-2013 15:00	MK-SB37-0.5	✓														
ES1322662-039	15-OCT-2013 15:00	MK-SB38-0.3	✓														
ES1322662-040	15-OCT-2013 15:00	MK-SB56-0.5	✓														
ES1322662-041	15-OCT-2013 15:00	D-151013-01-GP	✓														
ES1322662-042	15-OCT-2013 15:00	T-151010-01-GP	✓														
ES1322662-043	16-OCT-2013 15:00	MK-SB14-3.0	✓														
ES1322662-044	16-OCT-2013 15:00	MK-SB39-1.5	✓														
ES1322662-045	16-OCT-2013 15:00	MK-SB39-2.0	✓														
ES1322662-046	16-OCT-2013 15:00	MK-SB39-3.0	✓														
ES1322662-047	16-OCT-2013 15:00	MK-SB39-4.0	✓														
ES1322662-048	16-OCT-2013 15:00	MK-SB39-5.9	✓														
ES1322662-049	16-OCT-2013 15:00	MK-SB68-1.5	✓														
ES1322662-050	16-OCT-2013 15:00	MK-SB68-2.0	✓														
ES1322662-051	16-OCT-2013 15:00	MK-SB68-3.0	✓														
ES1322662-052	16-OCT-2013 15:00	MK-SB68-5.0	✓														
ES1322662-053	16-OCT-2013 15:00	MK-SB68-6.0	✓														
ES1322662-054	16-OCT-2013 15:00	ML-MW03-0.5	✓														
ES1322662-055	16-OCT-2013 15:00	ML-MW05-0.1	✓														
ES1322662-058	14-OCT-2013 15:00	MK-SB14-1.5	✓														
ES1322662-059	14-OCT-2013 15:00	MK-SB14-2.0	✓														

### Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

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### THE ACCOUNTS PAYABLE

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Email au.accounts@erm.com





ERM  
Sydney  
Melbourne  
Perth  
Brisbane  
Parramatta  
Hunter Valley  
North Coast  
Other

Grnd Floor, 33 Saunders Street, Pyrmont, NSW, 2009, (ph) 02 8584 8666 (fax) 02 8584 8600  
Level 3, Yarra Tower, WTC, 10-38 Stables Street, Docklands, VIC, 3005, (ph) 03 9696 8011 (fax) 03 9696 8022  
Level 1, 60 Leichhardt Street, Spring Hill, QLD, 4004, (ph) 07 3839 8393 (fax) 07 3839 8381  
Level 6, Grain Pool Bld, 172 St Georges Tce, WA, 6850, (ph) 08 9321 5200 (fax) 08 9321 5262  
53 Bonville Avenue, Thornton, NSW, 2022, (ph) 02 4964 2150 (fax) 02 4964 2152  
Suite 3/146 Gordon Street, Port Macquarie, NSW, 2444, (ph) 02 6584 7155 (fax) 02 6584 7160

Project No: 0287473  
Project Name: Symphany  
Project Location: Mt. Piper  
Project Manager: Jonathan Lekawski  
Sampler: Gavin Powell

COC Number  
A 11723  
Laboratory  
ALS

Laboratory Number	Sample ID	Sample Depth	Sample Date	Sample Time	Matrix		Preservation			Containers (num/type)	Yes (tick)	BTX	TPH (C6-C9 P & T) +	Speciated TPH	VOC Scan (USEPA 8260 List)	SVOC Scan (USEPA 8270 List)	OC OP Pesticides	PAH	Phenols	PCB	Metals* (dissolved / total)	Asbestos	VOC Scan	HOLD	Other Comments on sample (eg: high voc, highly contaminated, special detection limits etc etc)
					W	S	W	S	W																
42	MK-SB37-10		15/10		X																				
37	MK-SB38-03				X																				
43	MK-SB38-05				X																				
44	MK-SB38-02				X																				
40	MK-SB38-05				X																				
45	MK-SB35-02				X																				
46	MK-SB37-10				X																				
47	MK-SB38-01				X																				
48	MK-SB38-05				X																				
41	DJ51013-01-CP				X																				
42	TJ51013-01-CP		15/10		X																				
43	MK-SB34-30		16/10		X																				
44	MK-SB39-15				X																				
45	MK-SB39-20				X																				
46	MK-SB39-30				X																				
47	MK-SB39-40				X																				
49	MK-SB39-50				X																				
48	MK-SB39-59				X																				
49	MK-SB39-15		16/10		X																				

Comments: quote # SY/278/13, email symphany-delta.west@erm.com

Relinquished by: Gavin Powell  
Signed: [Signature]  
Date/Time: 17/10/13 0630

Received by: FAS  
Date/Time: 18/10/13 10:30

Relinquished by: [Signature]  
Signed: [Signature]  
Date/Time: [Signature]

\*Metals (circle)  
As Pb Cd Cr Cu Hg Ni Pb Zn Se



- Sydney
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- Hunter Valley
- North Coast
- Other

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 Level 6, Grain Pool Bld, 172 St Georges Tce, WA, 6850. (ph) 08 9321 5200 (fax) 08 9321 5282  
 53 Bonville Avenue, Thornton, NSW, 2022. (ph) 02 4964 2150 (fax) 02 4964 2152  
 Suite 3/146 Gordon Street, Port Macquarie, NSW, 2444. (ph) 02 6584 7155 (fax) 02 6584 7160

Project No: 0207473  
 Project Name: Symphony  
 Project Location: ML Piper  
 Project Manager: Jonathan Leksowski  
 Sampler: Gavin Powell + Thavone Shaw

IOC Number: A 11724  
 Laboratory: ALS

General Analysis Requirements

1. Turn Around Time (please tick):  1 Day  2 Days  3 Days  Normal TAT
2. Do you wish any sediment layers in water to be excluded from extractions?
3. Additional QA/QC reported where sample batches are < 10 samples?
4. % of extraneous material removed from samples to be reported as per NIEPM 5.1.1?

Laboratory Number	Sample ID	Sample Depth	Sample Date	Sample Time	Matrix	Preservation			Containers (number/type)	Yes (tick)
						Water	Soil	Other		
50	ML-SB68-2.0	16/10			X	X	X			
51	ML-SB68-3.0				X	X	X			
52	ML-SB68-4.0				X	X	X			
53	ML-SB68-5.0				X	X	X			
54	ML-SB68-6.0				X	X	X			
55	ML-SB68-7.0				X	X	X			
56	ML-SB68-8.0				X	X	X			
57	ML-SB68-9.0				X	X	X			
58	ML-SB68-10.0				X	X	X			
59	ML-SB68-11.0				X	X	X			
60	ML-SB68-12.0				X	X	X			
61	ML-SB68-13.0				X	X	X			
62	ML-SB68-14.0				X	X	X			
63	ML-SB68-15.0				X	X	X			
64	ML-SB68-16.0				X	X	X			
65	ML-SB68-17.0				X	X	X			
66	ML-SB68-18.0				X	X	X			
67	ML-SB68-19.0				X	X	X			
68	ML-SB68-20.0				X	X	X			
69	ML-SB68-21.0				X	X	X			
70	ML-SB68-22.0				X	X	X			
71	ML-SB68-23.0				X	X	X			
72	ML-SB68-24.0				X	X	X			
73	ML-SB68-25.0				X	X	X			
74	ML-SB68-26.0				X	X	X			
75	ML-SB68-27.0				X	X	X			
76	ML-SB68-28.0				X	X	X			
77	ML-SB68-29.0				X	X	X			
78	ML-SB68-30.0				X	X	X			
79	ML-SB68-31.0				X	X	X			
80	ML-SB68-32.0				X	X	X			
81	ML-SB68-33.0				X	X	X			
82	ML-SB68-34.0				X	X	X			
83	ML-SB68-35.0				X	X	X			
84	ML-SB68-36.0				X	X	X			
85	ML-SB68-37.0				X	X	X			
86	ML-SB68-38.0				X	X	X			
87	ML-SB68-39.0				X	X	X			
88	ML-SB68-40.0				X	X	X			
89	ML-SB68-41.0				X	X	X			
90	ML-SB68-42.0				X	X	X			
91	ML-SB68-43.0				X	X	X			
92	ML-SB68-44.0				X	X	X			
93	ML-SB68-45.0				X	X	X			
94	ML-SB68-46.0				X	X	X			
95	ML-SB68-47.0				X	X	X			
96	ML-SB68-48.0				X	X	X			
97	ML-SB68-49.0				X	X	X			
98	ML-SB68-50.0				X	X	X			
99	ML-SB68-51.0				X	X	X			
100	ML-SB68-52.0				X	X	X			

Other Comments on sample (eg: high voc, highly contaminated, special detection limits etc etc)

Metals (dissolved / total)  
 PCB  
 Phenols  
 PAH  
 OC OP Pesticides  
 SVOC Scan (USEPA 8270 List)  
 VOC Scan (USEPA 8260 List)  
 Speciated TPH  
 TPH (C6-C9 P 1) +  
 BTEX

Comments: quote # SY/278/13, email symphony-deltaest@ajermi.com  
 Relinquished by: Gavin Powell  
 Signed: [Signature]  
 Date/Time: 17/10/13  
 Received by: [Signature]  
 Date/Time: 17/10/13  
 Relinquished by:  
 Signed:  
 Date/Time:



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- Brisbane
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Project No: **0707923**  
 Project Name: **Symphony**  
 Project Location: **Mt Ape**  
 Project Manager: **Jonathan Lohanski**  
 Sampler: **Gravin Knoch**

GOC Number  
**A 11725**  
 Laboratory  
**ALS**

**General Analysis Requirements**

1. Turn Around Time (please tick:  1 Day  2 Days  3 Days  Normal TAT)
2. Do you wish any sediment layers in water to be excluded from extractions?
3. Additional QA/QC reported where sample batches are < 10 samples?
4. % of extraneous material removed from samples to be reported as per NERM 5.1.1?

Laboratory Number	Sample ID	Sample Depth	Sample Date	Sample Time	Matrix		Preservation			Containers (number/type)	BTX	TPH (C6-C9 P 1) +	Speciated TPH	VOC Scan (USEPA 8260 List)	SVOC Scan (USEPA 8270 List)	OC DP Pesticides	PAH	Phenols	PCB	Metals (dissolved / total)	Other Comments on sample (eg. high voc, highly contaminated, special detection limits etc etc)	
					Water	Soil	Acid	Filter	Other													
56	DJ151013-01-GP		15/10		X		X			1												
57	TJ151013-01-GP		15/10		X		X			1												
58	MK5814-1-5		19/10		X		X			1												
59	MK5814-2-0		19/10		X		X			1												
	<del>Temp Spk</del>				X		X			1												
	<del>Temp Blank</del>				X		X			1												

Comments: **as per other pages**

Relinquished by: **Gravin Knoch** Signed: *[Signature]* Date/Time: **17/10/06 30**

Relinquished by: \_\_\_\_\_ Signed: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Received by: **FA-51** Date/Time: **18/10/06 09:50**

Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_

## CERTIFICATE OF ANALYSIS

Work Order	: <b>ES1323031</b>	Page	: 1 of 18
Client	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: 0207423 SYMPHONY	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: 11726	Date Samples Received	: 23-OCT-2013
Sampler	: GP	Issue Date	: 04-NOV-2013
Site	: MT. PIPER		
Quote number	: SY/278/13 V3	No. of samples received	: 20
		No. of samples analysed	: 17

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EA200 Legend**
- **EA200 'Am' Amosite (brown asbestos)**
- **EA200 'Ch' Chrysotile (white asbestos)**
- **EA200 'Cr' Crocidolite (blue asbestos)**
- **EA200 'Trace' - Asbestos fibres detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres**
- **EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.**
- **EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.**
- **EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.**



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

## Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Edwandy Fadjjar	Organic Coordinator	Sydney Organics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Peter Rennie	Asbestos Identifier	Newcastle - Asbestos
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				MK_SB13_1.0	MK_SB13_0.5	MK_SB12_0.2	MK_SB27_0.2	MK_SB33_0.5
				17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323031-001	ES1323031-002	ES1323031-003	ES1323031-004	ES1323031-006
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	25.2	----	18.1	21.9	----
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	----	No	No	No	No
Asbestos Type	1332-21-4	0.1	--	----	-	-	-	-
Sample weight (dry)	----	0.01	g	----	216	434	247	467
APPROVED IDENTIFIER:	----	-	--	----	C.OWLER	C.OWLER	C.OWLER	C.OWLER
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	----	<5	<5	----
Arsenic	7440-38-2	5	mg/kg	<5	----	<5	18	----
Cadmium	7440-43-9	1	mg/kg	<1	----	<1	<1	----
Chromium	7440-47-3	2	mg/kg	<2	----	6	15	----
Copper	7440-50-8	5	mg/kg	11	----	9	16	----
Lead	7439-92-1	5	mg/kg	15	----	12	44	----
Nickel	7440-02-0	2	mg/kg	6	----	9	22	----
Zinc	7440-66-6	5	mg/kg	62	----	87	50	----
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	<0.1	<0.1	----
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	----	----	----	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	<0.5	----	----	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	----	----	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	----	----	----	----
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	----	----	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	----	----	----	----
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	----	----	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	----	----	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	----	----	----	----
n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	----	----	----	----
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	<5	----	----	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	----	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	----	----	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				MK_SB13_1.0	MK_SB13_0.5	MK_SB12_0.2	MK_SB27_0.2	MK_SB33_0.5
				17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00
				ES1323031-001	ES1323031-002	ES1323031-003	ES1323031-004	ES1323031-006
Compound	CAS Number	LOR	Unit					
<b>EP074B: Oxygenated Compounds - Continued</b>								
2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	----	----	----	----
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	----	----	----	----
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	----	----	----	----
1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	----	----	----	----
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	----	----	----	----
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	----	----	----	----
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	----	----	----	----
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	----	----	----	----
Chloromethane	74-87-3	5	mg/kg	<5	----	----	----	----
Vinyl chloride	75-01-4	5	mg/kg	<5	----	----	----	----
Bromomethane	74-83-9	5	mg/kg	<5	----	----	----	----
Chloroethane	75-00-3	5	mg/kg	<5	----	----	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg	<5	----	----	----	----
1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	----	----	----	----
Iodomethane	74-88-4	0.5	mg/kg	<0.5	----	----	----	----
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	----	----	----	----
1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	----	----	----	----
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	----	----	----	----
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	----	----	----	----
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	----	----	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	----	----	----	----
1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	----	----	----	----
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	----	----	----	----
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	----	----	----	----
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	----	----	----	----
1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	----	----	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	----	----	----	----
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	----	----	----	----
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	----	----	----	----
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	----	----	----	----





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB13_1.0	MK_SB13_0.5	MK_SB12_0.2	MK_SB27_0.2	MK_SB33_0.5
				17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323031-001	ES1323031-002	ES1323031-003	ES1323031-004	ES1323031-006
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	----	----	----	----
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	----	----	----	----
Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	----	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	----	----	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	----	----	----	----
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	----	----	----	----
Bromobenzene	108-86-1	0.5	mg/kg	<0.5	----	----	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	----	----	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	----	----	----	----
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	----	----	----	----
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	----	----	----	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	----	----	----	----
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	----	----	----	----
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	<0.5	----	----	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	----	----	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	----	----	----	----
Bromoform	75-25-2	0.5	mg/kg	<0.5	----	----	----	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	----	<1	<1	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	----	<2	<2	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB13_1.0	MK_SB13_0.5	MK_SB12_0.2	MK_SB27_0.2	MK_SB33_0.5
				17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323031-001	ES1323031-002	ES1323031-003	ES1323031-004	ES1323031-006
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	----	<b>0.6</b>	<b>0.6</b>	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	----	<b>1.2</b>	<b>1.2</b>	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	----	<10	<10	----
C10 - C14 Fraction	----	50	mg/kg	<50	----	<50	<50	----
C15 - C28 Fraction	----	100	mg/kg	<100	----	<100	<100	----
C29 - C36 Fraction	----	100	mg/kg	<100	----	<100	<100	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	<50	<50	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	<10	<10	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	----	<10	<10	----
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	----	<50	<50	----
>C16 - C34 Fraction	----	100	mg/kg	<100	----	<100	<100	----
>C34 - C40 Fraction	----	100	mg/kg	<100	----	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	<50	<50	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB13_1.0	MK_SB13_0.5	MK_SB12_0.2	MK_SB27_0.2	MK_SB33_0.5
				17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323031-001	ES1323031-002	ES1323031-003	ES1323031-004	ES1323031-006
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 - Continued</b>								
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	----	<50	<50	----
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	<0.2	<0.2	----
Toluene	108-88-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	----	<0.2	<0.2	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Naphthalene	91-20-3	1	mg/kg	<1	----	<1	<1	----
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	70.5	----	----	----	----
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	91.2	----	----	----	----
Toluene-D8	2037-26-5	0.1	%	114	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	108	----	----	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	86.8	----	99.9	101	----
2-Chlorophenol-D4	93951-73-6	0.1	%	87.6	----	106	104	----
2,4,6-Tribromophenol	118-79-6	0.1	%	102	----	104	104	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	100	----	105	111	----
Anthracene-d10	1719-06-8	0.1	%	82.9	----	88.8	93.8	----
4-Terphenyl-d14	1718-51-0	0.1	%	92.7	----	96.4	108	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	89.9	----	82.8	87.3	----
Toluene-D8	2037-26-5	0.1	%	115	----	87.6	92.3	----
4-Bromofluorobenzene	460-00-4	0.1	%	111	----	88.8	94.2	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB33_1.0	MK_SB34_0.2	MK_SB34_0.8	MK_SB35_1.0	MK_SB28_0.2
				17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323031-007	ES1323031-008	ES1323031-009	ES1323031-011	ES1323031-012
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	28.3	----	26.0	17.2	21.4
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	----	No	----	No	No
Asbestos Type	1332-21-4	0.1	--	----	-	----	-	-
Sample weight (dry)	----	0.01	g	----	535	----	257	332
APPROVED IDENTIFIER:	----	-	--	----	C.OWLER	----	C.OWLER	P.RENNIE
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	----	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	<5	----	6	18	7
Cadmium	7440-43-9	1	mg/kg	<1	----	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	12	----	8	9	9
Copper	7440-50-8	5	mg/kg	6	----	7	29	8
Lead	7439-92-1	5	mg/kg	11	----	21	37	18
Nickel	7440-02-0	2	mg/kg	4	----	11	54	13
Zinc	7440-66-6	5	mg/kg	12	----	26	90	23
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	<0.1	<0.1	<0.1
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	----	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	----	<2	<2	<2
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	<0.5	1.0	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB33_1.0	MK_SB34_0.2	MK_SB34_0.8	MK_SB35_1.0	MK_SB28_0.2
				17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323031-007	ES1323031-008	ES1323031-009	ES1323031-011	ES1323031-012
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	<0.5	<b>1.3</b>	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	----	<0.5	<b>2.3</b>	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	----	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	----	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	----	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	----	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	----	<100	<b>310</b>	<100
C29 - C36 Fraction	----	100	mg/kg	<100	----	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	<50	<b>310</b>	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	----	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	----	<50	<b>120</b>	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	----	<100	<b>260</b>	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	----	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	<50	<b>380</b>	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	----	<50	<b>120</b>	<50



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB33_1.0	MK_SB34_0.2	MK_SB34_0.8	MK_SB35_1.0	MK_SB28_0.2
				17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00	17-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323031-007	ES1323031-008	ES1323031-009	ES1323031-011	ES1323031-012
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	----	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	----	<1	<1	<1
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	83.2	----	99.4	88.8	87.8
2-Chlorophenol-D4	93951-73-6	0.1	%	92.0	----	107	94.9	88.1
2,4,6-Tribromophenol	118-79-6	0.1	%	102	----	99.0	99.1	109
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	105	----	112	103	99.9
Anthracene-d10	1719-06-8	0.1	%	91.5	----	94.9	85.4	88.7
4-Terphenyl-d14	1718-51-0	0.1	%	120	----	103	95.2	97.9
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	86.5	----	86.8	79.7	82.1
Toluene-D8	2037-26-5	0.1	%	94.6	----	86.0	90.7	85.8
4-Bromofluorobenzene	460-00-4	0.1	%	95.7	----	94.7	87.2	90.6



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB22_0.5	MK_SB18_0.1	MK_SB19_0.1	MK_SB20_0.1	MK_SB25_0.2
				17-OCT-2013 15:00	18-OCT-2013 15:00	18-OCT-2013 15:00	18-OCT-2013 15:00	18-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323031-013	ES1323031-014	ES1323031-015	ES1323031-016	ES1323031-017
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	14.5	7.6	9.6	8.6	11.0
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No
Asbestos Type	1332-21-4	0.1	--	-	-	-	-	-
Sample weight (dry)	----	0.01	g	270	151	209	213	335
APPROVED IDENTIFIER:	----	-	--	P.RENNIE	P.RENNIE	P.RENNIE	P.RENNIE	P.RENNIE
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	<5	<5	7	7	6
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	4	5	8	15	6
Copper	7440-50-8	5	mg/kg	6	6	12	11	14
Lead	7439-92-1	5	mg/kg	12	10	14	20	17
Nickel	7440-02-0	2	mg/kg	4	3	15	22	17
Zinc	7440-66-6	5	mg/kg	55	90	38	43	50
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB22_0.5	MK_SB18_0.1	MK_SB19_0.1	MK_SB20_0.1	MK_SB25_0.2
				17-OCT-2013 15:00	18-OCT-2013 15:00	18-OCT-2013 15:00	18-OCT-2013 15:00	18-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323031-013	ES1323031-014	ES1323031-015	ES1323031-016	ES1323031-017
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	0.7
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	0.7
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	1.2	1.2	1.2
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB22_0.5	MK_SB18_0.1	MK_SB19_0.1	MK_SB20_0.1	MK_SB25_0.2
				17-OCT-2013 15:00	18-OCT-2013 15:00	18-OCT-2013 15:00	18-OCT-2013 15:00	18-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323031-013	ES1323031-014	ES1323031-015	ES1323031-016	ES1323031-017
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	86.5	97.3	92.0	95.5	87.4
2-Chlorophenol-D4	93951-73-6	0.1	%	97.0	105	100	98.1	88.3
2,4,6-Tribromophenol	118-79-6	0.1	%	94.5	102	99.8	97.3	95.2
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	103	111	106	107	94.2
Anthracene-d10	1719-06-8	0.1	%	88.4	93.9	89.6	88.1	84.7
4-Terphenyl-d14	1718-51-0	0.1	%	95.5	112	97.2	97.4	81.4
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	91.2	82.8	89.4	84.5	93.9
Toluene-D8	2037-26-5	0.1	%	94.5	83.3	91.5	83.6	95.4
4-Bromofluorobenzene	460-00-4	0.1	%	99.5	86.1	96.0	88.8	97.8



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				MK_SB26_0.2	MK_SB17_0.5	---	---	---
				18-OCT-2013 15:00	18-OCT-2013 15:00	---	---	---
Compound	CAS Number	LOR	Unit	ES1323031-018	ES1323031-019	---	---	---
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	---	1.0	%	14.0	---	---	---	---
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	---	---	---
Asbestos Type	1332-21-4	0.1	--	-	-	---	---	---
Sample weight (dry)	---	0.01	g	194	373	---	---	---
APPROVED IDENTIFIER:	---	-	--	P.RENNIE	P.RENNIE	---	---	---
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	---	---	---	---
Arsenic	7440-38-2	5	mg/kg	12	---	---	---	---
Cadmium	7440-43-9	1	mg/kg	<1	---	---	---	---
Chromium	7440-47-3	2	mg/kg	8	---	---	---	---
Copper	7440-50-8	5	mg/kg	23	---	---	---	---
Lead	7439-92-1	5	mg/kg	25	---	---	---	---
Nickel	7440-02-0	2	mg/kg	29	---	---	---	---
Zinc	7440-66-6	5	mg/kg	54	---	---	---	---
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	---	---	---	---
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	---	---	---	---
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	---	---	---	---
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	---	---	---	---
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	---	---	---	---
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	---	---	---	---
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	---	---	---	---
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	---	---	---	---
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	---	---	---	---
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	---	---	---	---
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	---	---	---	---
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	---	---	---	---
Pentachlorophenol	87-86-5	2	mg/kg	<2	---	---	---	---
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	---	---	---	---
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	---	---	---	---



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				MK_SB26_0.2	MK_SB17_0.5	---	---	---
				18-OCT-2013 15:00	18-OCT-2013 15:00	---	---	---
Compound	CAS Number	LOR	Unit	ES1323031-018	ES1323031-019	---	---	---
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	---	---	---	---
Fluorene	86-73-7	0.5	mg/kg	<0.5	---	---	---	---
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	---	---	---	---
Anthracene	120-12-7	0.5	mg/kg	<0.5	---	---	---	---
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	---	---	---	---
Pyrene	129-00-0	0.5	mg/kg	<0.5	---	---	---	---
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	---	---	---	---
Chrysene	218-01-9	0.5	mg/kg	<0.5	---	---	---	---
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	---	---	---	---
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	---	---	---	---
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	---	---	---	---
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	---	---	---	---
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	---	---	---	---
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	---	---	---	---
^ Sum of polycyclic aromatic hydrocarbons	---	0.5	mg/kg	<0.5	---	---	---	---
^ Benzo(a)pyrene TEQ (zero)	---	0.5	mg/kg	<0.5	---	---	---	---
^ Benzo(a)pyrene TEQ (half LOR)	---	0.5	mg/kg	<b>0.6</b>	---	---	---	---
^ Benzo(a)pyrene TEQ (LOR)	---	0.5	mg/kg	<b>1.2</b>	---	---	---	---
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	---	10	mg/kg	<10	---	---	---	---
C10 - C14 Fraction	---	50	mg/kg	<50	---	---	---	---
C15 - C28 Fraction	---	100	mg/kg	<100	---	---	---	---
C29 - C36 Fraction	---	100	mg/kg	<100	---	---	---	---
^ C10 - C36 Fraction (sum)	---	50	mg/kg	<50	---	---	---	---
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	---	---	---	---
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	---	---	---	---
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	---	---	---	---
>C16 - C34 Fraction	---	100	mg/kg	<100	---	---	---	---
>C34 - C40 Fraction	---	100	mg/kg	<100	---	---	---	---
^ >C10 - C40 Fraction (sum)	---	50	mg/kg	<50	---	---	---	---
^ >C10 - C16 Fraction minus Naphthalene (F2)	---	50	mg/kg	<50	---	---	---	---



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				MK_SB26_0.2	MK_SB17_0.5	----	----	----
				18-OCT-2013 15:00	18-OCT-2013 15:00	----	----	----
Compound	CAS Number	LOR	Unit	ES1323031-018	ES1323031-019	----	----	----
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	----	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg	<1	----	----	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	96.9	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	104	----	----	----	----
2,4,6-Tribromophenol	118-79-6	0.1	%	96.7	----	----	----	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	109	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%	92.8	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	104	----	----	----	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	94.6	----	----	----	----
Toluene-D8	2037-26-5	0.1	%	93.6	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	98.8	----	----	----	----



## Analytical Results

### Descriptive Results

Sub-Matrix: **SOIL**

<i>Method: Compound</i>	<i>Client sample ID - Client sampling date / time</i>	<i>Analytical Results</i>
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>		
EA200: Description	MK_SB13_0.5 - 17-OCT-2013 15:00	Pale brown clay soil with some grey rocks plus some quartz and slag grains plus a trace of vegetation
EA200: Description	MK_SB12_0.2 - 17-OCT-2013 15:00	Pale brown clay soil with some grey rocks plus some quartz grains plus a trace of vegetation
EA200: Description	MK_SB27_0.2 - 17-OCT-2013 15:00	Pale brown clay soil with some grey rocks plus some quartz grains plus a trace of vegetation
EA200: Description	MK_SB33_0.5 - 17-OCT-2013 15:00	Pale brown clay soil with some grey rocks plus some quartz grains plus a trace of vegetation
EA200: Description	MK_SB34_0.2 - 17-OCT-2013 15:00	Mid grey rocky soil with a trace of vegetation
EA200: Description	MK_SB35_1.0 - 17-OCT-2013 15:00	Mid grey rocky soil with a trace of vegetation
EA200: Description	MK_SB28_0.2 - 17-OCT-2013 15:00	Pale brown soil with some vegetation and small brown rocks and coal pieces
EA200: Description	MK_SB22_0.5 - 17-OCT-2013 15:00	Pale brown soil with some vegetation and small brown rocks and coal pieces
EA200: Description	MK_SB18_0.1 - 18-OCT-2013 15:00	Pale brown soil with some vegetation and small brown rocks
EA200: Description	MK_SB19_0.1 - 18-OCT-2013 15:00	Grey-brown soil with some vegetation and small grey and orange-brown rocks and coal pieces
EA200: Description	MK_SB20_0.1 - 18-OCT-2013 15:00	Grey-brown soil with some vegetation and small coal pieces
EA200: Description	MK_SB25_0.2 - 18-OCT-2013 15:00	Grey soil with some vegetation and small white rocks and coal pieces
EA200: Description	MK_SB26_0.2 - 18-OCT-2013 15:00	Grey-brown soil with some vegetation and small grey and orange-brown rocks and coal pieces
EA200: Description	MK_SB17_0.5 - 18-OCT-2013 15:00	Grey-brown soil with small orange-brown rocks and concrete and coal pieces



## Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP066S: PCB Surrogate</b>			
Decachlorobiphenyl	2051-24-3	39	149
<b>EP074S: VOC Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	64	130
Toluene-D8	2037-26-5	66	136
4-Bromofluorobenzene	460-00-4	60	122
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0



## QUALITY CONTROL REPORT

Work Order	: <b>ES1323031</b>	Page	: 1 of 17
Client	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: 0207423 SYMPHONY	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: MT. PIPER	Date Samples Received	: 23-OCT-2013
C-O-C number	: 11726	Issue Date	: 04-NOV-2013
Sampler	: GP	No. of samples received	: 20
Order number	: ----	No. of samples analysed	: 17
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :  
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
RPD = Relative Percentage Difference  
# = Indicates failed QC



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

## Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Edwandy Fadjjar	Organic Coordinator	Sydney Organics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Peter Rennie	Asbestos Identifier	Newcastle - Asbestos
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics



## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EA055: Moisture Content (QC Lot: 3128859)</b>									
ES1323031-001	MK_SB13_1.0	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	25.2	24.6	2.3	0% - 20%
ES1323031-017	MK_SB25_0.2	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	11.0	10.6	4.0	0% - 50%
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3129825)</b>									
ES1323031-001	MK_SB13_1.0	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	<2	3	47.3	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	6	6	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	7	29.4	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	11	13	12.2	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	15	17	9.7	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	62	80	26.0	0% - 50%
ES1323031-016	MK_SB20_0.1	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	15	8	55.8	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	22	14	49.4	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	7	6	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	11	8	24.6	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	20	19	7.5	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	43	25	52.1	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3129824)</b>									
ES1322916-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1322966-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3129826)</b>									
ES1323031-001	MK_SB13_1.0	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1323031-016	MK_SB20_0.1	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 3126739)</b>									
ES1323051-002	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1323051-023	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3128056)</b>									
ES1323100-001	Anonymous	EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3128056) - continued</b>									
ES1323100-001	Anonymous	EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1323101-004	Anonymous	EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074B: Oxygenated Compounds (QC Lot: 3128056)</b>									
ES1323100-001	Anonymous	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.0	No Limit
ES1323101-004	Anonymous	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.0	No Limit
<b>EP074C: Sulfonated Compounds (QC Lot: 3128056)</b>									
ES1323100-001	Anonymous	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1323101-004	Anonymous	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074D: Fumigants (QC Lot: 3128056)</b>									
ES1323100-001	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1323101-004	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3128056)</b>									
ES1323100-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3128056) - continued</b>									
ES1323100-001	Anonymous	EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.0	No Limit
ES1323101-004	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3128056) - continued</b>									
ES1323101-004	Anonymous	EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.0	No Limit
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.0	No Limit		
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3128056)</b>									
ES1323100-001	Anonymous	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1323101-004	Anonymous	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074G: Trihalomethanes (QC Lot: 3128056)</b>									
ES1323100-001	Anonymous	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1323101-004	Anonymous	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3128269)</b>									



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3128269) - continued</b>									
ES1323031-001	MK_SB13_1.0	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit		
ES1323031-016	MK_SB20_0.1	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit		
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3128269)</b>									
ES1323031-001	MK_SB13_1.0	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1,2,3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit





Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3128269) - continued</b>									
ES1323031-001	MK_SB13_1.0	EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1323031-016	MK_SB20_0.1	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3126354)</b>									
ES1322913-007	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1323031-014	MK_SB18_0.1	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3128057)</b>									
ES1323100-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1323101-004	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3128268)</b>									
ES1323031-001	MK_SB13_1.0	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1323031-016	MK_SB20_0.1	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3126354)</b>									
ES1322913-007	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES1323031-014	MK_SB18_0.1	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3128057)</b>									



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3128057) - continued</b>									
ES1323100-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES1323101-004	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3128268)</b>									
ES1323031-001	MK_SB13_1.0	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
ES1323031-016	MK_SB20_0.1	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3126354)</b>									
ES1322913-007	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES1323031-014	MK_SB18_0.1	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3128057)</b>									
ES1323100-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES1323101-004	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit



## Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3129825)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	112	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	107	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	116	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	112	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	106	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	118	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	96.4	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	115	81	133	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3129824)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	91.8	66	112	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3129826)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	91.8	66	112	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3126739)</b>									
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	87.6	57.4	117	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3128056)</b>									
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	95.2	64	126	
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	95.3	66	128	
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	95.3	63	129	
EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	93.9	63	129	
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	95.9	64	130	
EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	95.3	63	129	
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	94.5	63	129	
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	94.6	62	130	
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	95.4	61	131	
<b>EP074B: Oxygenated Compounds (QCLot: 3128056)</b>									
EP074: Vinyl Acetate	108-05-4	1	mg/kg	----	10 mg/kg	52.9	29.6	156	
		5	mg/kg	<5	----	----	----	----	
EP074: 2-Butanone (MEK)	78-93-3	1	mg/kg	----	10 mg/kg	123	58	136	
		5	mg/kg	<5	----	----	----	----	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	1	mg/kg	----	10 mg/kg	128	54	138	
		5	mg/kg	<5	----	----	----	----	
EP074: 2-Hexanone (MBK)	591-78-6	1	mg/kg	----	10 mg/kg	105	54	136	
		5	mg/kg	<5	----	----	----	----	
<b>EP074C: Sulfonated Compounds (QCLot: 3128056)</b>									



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074C: Sulfonated Compounds (QCLot: 3128056) - continued</b>									
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	64.3	54	126	
<b>EP074D: Fumigants (QCLot: 3128056)</b>									
EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	83.3	55	133	
EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	93.1	69	127	
EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	102	54	124	
EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	80.8	51	125	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	91.4	66	126	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3128056)</b>									
EP074: Dichlorodifluoromethane	75-71-8	1	mg/kg	----	10 mg/kg	40.2	30	148	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloromethane	74-87-3	1	mg/kg	----	10 mg/kg	51.0	41	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Vinyl chloride	75-01-4	1	mg/kg	----	10 mg/kg	70.8	43	147	
		5	mg/kg	<5	----	----	----	----	
EP074: Bromomethane	74-83-9	1	mg/kg	----	10 mg/kg	64.2	47	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloroethane	75-00-3	1	mg/kg	----	10 mg/kg	74.3	49	143	
		5	mg/kg	<5	----	----	----	----	
EP074: Trichlorofluoromethane	75-69-4	1	mg/kg	----	10 mg/kg	75.6	49	135	
		5	mg/kg	<5	----	----	----	----	
EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	83.7	54	126	
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	71.9	43	129	
EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	85.0	62	130	
EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	90.4	66	132	
EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	96.0	66	132	
EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	85.4	62	126	
EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	97.0	64	128	
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	82.9	59	125	
EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	98.7	65	123	
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	95.6	64	120	
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	96.8	65	127	
EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	98.8	70	130	
EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	97.2	72	128	
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	99.6	67	143	
EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	86.9	62	122	
EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	91.8	54	128	
EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	93.1	55	129	
EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	94.2	56	132	
EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	98.3	65	135	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3128056) - continued</b>									
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	74.4	19.8	134	
EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	85.3	53	129	
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	91.8	48	136	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3128056)</b>									
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	98.0	70	128	
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	95.0	67	127	
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	95.5	64	130	
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	93.5	62	130	
EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	97.6	63	129	
EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	98.3	63	129	
EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	96.0	66	128	
EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	92.3	54	134	
EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	96.5	60	132	
<b>EP074G: Trihalomethanes (QCLot: 3128056)</b>									
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	95.2	62	120	
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	82.8	61	121	
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	84.8	63	121	
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	86.4	60	126	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3128269)</b>									
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	83.0	74	116	
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	90.5	74	116	
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	84.4	72	116	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	85.5	69	123	
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	88.1	60.3	117	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	81.6	69	117	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	83.2	68	112	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	85.6	73	117	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	83.2	76.4	114	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	93.8	57	111	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	90.5	68.9	112	
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	25.6	3.9	57	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3128269)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	88.6	80	124	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	94.7	77	123	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	94.9	79	123	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	91.9	77	123	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	93.3	79	123	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	94.0	79	123	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3128269) - continued</b>									
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	92.0	79	123	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	92.6	79	125	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	90.8	73	121	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	94.3	81	123	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	97.4	70	118	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	92.9	77	123	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	91.7	76	122	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	86.6	71	113	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	85.8	71.7	113	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	85.2	72.4	114	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3126354)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	91.0	68.4	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3128057)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	102	68.4	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3128268)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	93.2	71	131	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	97.6	74	138	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	95.1	64	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3126354)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	90.3	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3128057)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	102	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3128268)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	94.7	70	130	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	97.5	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	
		50	mg/kg	----	150 mg/kg	87.3	63	131	
<b>EP080: BTEXN (QCLot: 3126354)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	88.1	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	88.7	62	128	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	87.1	58	118	
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	87.2	60	120	
	106-42-3								
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	89.4	60	120	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	87.4	62	138	
<b>EP080: BTEXN (QCLot: 3128057)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	101	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	103	62	128	



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit		Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High
<b>EP080: BTEXN (QCLot: 3128057) - continued</b>								
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	98.4	58	118
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	99.9	60	120
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	103	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	93.5	62	138

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%) Low High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3129825)</b>							
ES1323031-001	MK_SB13_1.0	EG005T: Arsenic	7440-38-2	50 mg/kg	108	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	106	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	108	70	130
		EG005T: Copper	7440-50-8	125 mg/kg	108	70	130
		EG005T: Lead	7439-92-1	125 mg/kg	106	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	110	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	103	70	130
		EG005T: Zinc	7440-66-6	125 mg/kg	114	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3129824)</b>							
ES1322916-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	106	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3129826)</b>							
ES1323031-001	MK_SB13_1.0	EG035T: Mercury	7439-97-6	5 mg/kg	104	70	130
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3126739)</b>							
ES1323051-002	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	84.0	70	130
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3128056)</b>							
ES1323100-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	91.0	70	130
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	94.4	70	130
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3128056)</b>							
ES1323100-001	Anonymous	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	97.2	70	130
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3128269)</b>							
ES1323031-001	MK_SB13_1.0	EP075(SIM): Phenol	108-95-2	10 mg/kg	89.3	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	87.5	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	82.5	60	130





Sub-Matrix: SOIL

				Matrix Spike (MS) Report				
				Spike Concentration	Spike Recovery(%) MS	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3128269) - continued</b>								
ES1323031-001	MK_SB13_1.0	EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	79.7	70	130	
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	69.9	20	130	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3128269)</b>								
ES1323031-001	MK_SB13_1.0	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	93.7	70	130	
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	91.1	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3126354)</b>								
ES1323031-014	MK_SB18_0.1	EP080: C6 - C9 Fraction	----	32.5 mg/kg	101	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3128057)</b>								
ES1323100-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	93.7	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3128268)</b>								
ES1323031-001	MK_SB13_1.0	EP071: C10 - C14 Fraction	----	640 mg/kg	89.7	73	137	
		EP071: C15 - C28 Fraction	----	3140 mg/kg	82.5	53	131	
		EP071: C29 - C36 Fraction	----	2860 mg/kg	69.7	52	132	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3126354)</b>								
ES1323031-014	MK_SB18_0.1	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	103	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3128057)</b>								
ES1323100-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	91.1	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3128268)</b>								
ES1323031-001	MK_SB13_1.0	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	109	73	137	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	74.2	53	131	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	53.8	52	132	
<b>EP080: BTEXN (QCLot: 3126354)</b>								
ES1323031-014	MK_SB18_0.1	EP080: Benzene	71-43-2	2.5 mg/kg	78.5	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	79.3	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	81.6	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	81.8	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	84.2	70	130	
	91-20-3	2.5 mg/kg	84.2	70	130			
<b>EP080: BTEXN (QCLot: 3128057)</b>								
ES1323100-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	85.9	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	89.8	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	88.2	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	88.5	70	130	
			106-42-3					
EP080: ortho-Xylene	95-47-6	2.5 mg/kg	91.8	70	130			



Sub-Matrix: SOIL

				Matrix Spike (MS) Report					
Laboratory sample ID		Client sample ID		Method: Compound	CAS Number	Spike Concentration	Spike Recovery(%) MS	Recovery Limits (%)	
								Low	High
<b>EP080: BTEXN (QCLot: 3128057) - continued</b>									
ES1323100-001		Anonymous		EP080: Naphthalene	91-20-3	2.5 mg/kg	89.6	70	130

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report									
Laboratory sample ID		Client sample ID		Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)			
							MS	MSD	Low	High	Value	Control Limit		
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3126354)</b>														
ES1323031-014		MK_SB18_0.1		EP080: C6 - C9 Fraction	----	32.5 mg/kg	101	----	70	130	----	----		
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3126354)</b>														
ES1323031-014		MK_SB18_0.1		EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	103	----	70	130	----	----		
<b>EP080: BTEXN (QCLot: 3126354)</b>														
ES1323031-014		MK_SB18_0.1		EP080: Benzene	71-43-2	2.5 mg/kg	78.5	----	70	130	----	----		
				EP080: Toluene	108-88-3	2.5 mg/kg	79.3	----	70	130	----	----		
				EP080: Ethylbenzene	100-41-4	2.5 mg/kg	81.6	----	70	130	----	----		
				EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	81.8	----	70	130	----	----		
					106-42-3									
				EP080: ortho-Xylene	95-47-6	2.5 mg/kg	84.2	----	70	130	----	----		
	EP080: Naphthalene	91-20-3	2.5 mg/kg	84.2	----	70	130	----	----					
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3126739)</b>														
ES1323051-002		Anonymous		EP066: Total Polychlorinated biphenyls	----	1 mg/kg	84.0	----	70	130	----	----		
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3128056)</b>														
ES1323100-001		Anonymous		EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	91.0	----	70	130	----	----		
				EP074: Trichloroethene	79-01-6	2.5 mg/kg	94.4	----	70	130	----	----		
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3128056)</b>														
ES1323100-001		Anonymous		EP074: Chlorobenzene	108-90-7	2.5 mg/kg	97.2	----	70	130	----	----		
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3128057)</b>														
ES1323100-001		Anonymous		EP080: C6 - C9 Fraction	----	32.5 mg/kg	93.7	----	70	130	----	----		
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3128057)</b>														
ES1323100-001		Anonymous		EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	91.1	----	70	130	----	----		
<b>EP080: BTEXN (QCLot: 3128057)</b>														
ES1323100-001		Anonymous		EP080: Benzene	71-43-2	2.5 mg/kg	85.9	----	70	130	----	----		
				EP080: Toluene	108-88-3	2.5 mg/kg	89.8	----	70	130	----	----		
				EP080: Ethylbenzene	100-41-4	2.5 mg/kg	88.2	----	70	130	----	----		



Sub-Matrix: SOIL				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number							
<b>EP080: BTEXN (QCLot: 3128057) - continued</b>										
ES1323100-001	Anonymous	EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	88.5	----	70	130	----	----
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	91.8	----	70	130	----	----
		EP080: Naphthalene	91-20-3	2.5 mg/kg	89.6	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3128268)</b>										
ES1323031-001	MK_SB13_1.0	EP071: C10 - C14 Fraction	----	640 mg/kg	89.7	----	73	137	----	----
		EP071: C15 - C28 Fraction	----	3140 mg/kg	82.5	----	53	131	----	----
		EP071: C29 - C36 Fraction	----	2860 mg/kg	69.7	----	52	132	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3128268)</b>										
ES1323031-001	MK_SB13_1.0	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	109	----	73	137	----	----
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	74.2	----	53	131	----	----
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	53.8	----	52	132	----	----
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3128269)</b>										
ES1323031-001	MK_SB13_1.0	EP075(SIM): Phenol	108-95-2	10 mg/kg	89.3	----	70	130	----	----
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	87.5	----	70	130	----	----
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	82.5	----	60	130	----	----
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	79.7	----	70	130	----	----
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	69.9	----	20	130	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3128269)</b>										
ES1323031-001	MK_SB13_1.0	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	93.7	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	91.1	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3129824)</b>										
ES1322916-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	106	----	70	130	----	----
<b>EG005T: Total Metals by ICP-AES (QCLot: 3129825)</b>										
ES1323031-001	MK_SB13_1.0	EG005T: Arsenic	7440-38-2	50 mg/kg	108	----	70	130	----	----
		EG005T: Cadmium	7440-43-9	50 mg/kg	106	----	70	130	----	----
		EG005T: Chromium	7440-47-3	50 mg/kg	108	----	70	130	----	----
		EG005T: Copper	7440-50-8	125 mg/kg	108	----	70	130	----	----
		EG005T: Lead	7439-92-1	125 mg/kg	106	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	110	----	70	130	----	----
		EG005T: Selenium	7782-49-2	50 mg/kg	103	----	70	130	----	----
		EG005T: Zinc	7440-66-6	125 mg/kg	114	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3129826)</b>										
ES1323031-001	MK_SB13_1.0	EG035T: Mercury	7439-97-6	5 mg/kg	104	----	70	130	----	----

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1323031</b>	Page	: 1 of 10
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: 0207423 SYMPHONY	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: MT. PIPER	Date Samples Received	: 23-OCT-2013
C-O-C number	: 11726	Issue Date	: 04-NOV-2013
Sampler	: GP	No. of samples received	: 20
Order number	: ----	No. of samples analysed	: 17
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EA055: Moisture Content</b>								
<b>Soil Glass Jar - Unpreserved (EA055-103)</b> MK_SB13_1.0, MK_SB27_0.2, MK_SB34_0.8, MK_SB28_0.2	MK_SB12_0.2, MK_SB33_1.0, MK_SB35_1.0, MK_SB22_0.5	17-OCT-2013	----	----	----	28-OCT-2013	31-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EA055-103)</b> MK_SB18_0.1, MK_SB20_0.1, MK_SB26_0.2	MK_SB19_0.1, MK_SB25_0.2	18-OCT-2013	----	----	----	28-OCT-2013	01-NOV-2013	✓
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
<b>Snap Lock Bag (EA200)</b> MK_SB13_0.5, MK_SB27_0.2, MK_SB35_1.0, MK_SB22_0.5	MK_SB12_0.2, MK_SB34_0.2, MK_SB28_0.2	17-OCT-2013	---	15-APR-2014	----	04-NOV-2013	03-MAY-2014	✓
<b>Snap Lock Bag (EA200)</b> MK_SB18_0.1, MK_SB20_0.1, MK_SB26_0.2	MK_SB19_0.1, MK_SB25_0.2, MK_SB17_0.5	18-OCT-2013	---	16-APR-2014	----	04-NOV-2013	03-MAY-2014	✓
<b>Soil Glass Jar - Unpreserved (EA200)</b> MK_SB33_0.5		17-OCT-2013	---	15-APR-2014	----	04-NOV-2013	03-MAY-2014	✓
<b>EG005T: Total Metals by ICP-AES</b>								
<b>Soil Glass Jar - Unpreserved (EG005T)</b> MK_SB13_1.0, MK_SB27_0.2, MK_SB34_0.8, MK_SB28_0.2	MK_SB12_0.2, MK_SB33_1.0, MK_SB35_1.0, MK_SB22_0.5	17-OCT-2013	29-OCT-2013	15-APR-2014	✓	29-OCT-2013	15-APR-2014	✓
<b>Soil Glass Jar - Unpreserved (EG005T)</b> MK_SB18_0.1, MK_SB20_0.1, MK_SB26_0.2	MK_SB19_0.1, MK_SB25_0.2	18-OCT-2013	29-OCT-2013	16-APR-2014	✓	29-OCT-2013	16-APR-2014	✓



Matrix: **SOIL** Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
<b>Soil Glass Jar - Unpreserved (EG035T)</b> MK_SB13_1.0, MK_SB27_0.2, MK_SB34_0.8, MK_SB28_0.2	MK_SB12_0.2, MK_SB33_1.0, MK_SB35_1.0, MK_SB22_0.5	17-OCT-2013	29-OCT-2013	14-NOV-2013	✔	29-OCT-2013	14-NOV-2013	✔
<b>Soil Glass Jar - Unpreserved (EG035T)</b> MK_SB18_0.1, MK_SB20_0.1, MK_SB26_0.2	MK_SB19_0.1, MK_SB25_0.2	18-OCT-2013	29-OCT-2013	15-NOV-2013	✔	29-OCT-2013	15-NOV-2013	✔
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
<b>Soil Glass Jar - Unpreserved (EP066)</b> MK_SB13_1.0		17-OCT-2013	25-OCT-2013	31-OCT-2013	✔	29-OCT-2013	04-DEC-2013	✔
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
<b>Soil Glass Jar - Unpreserved (EP071)</b> MK_SB13_1.0, MK_SB27_0.2, MK_SB34_0.8, MK_SB28_0.2	MK_SB12_0.2, MK_SB33_1.0, MK_SB35_1.0, MK_SB22_0.5	17-OCT-2013	28-OCT-2013	31-OCT-2013	✔	29-OCT-2013	07-DEC-2013	✔
<b>Soil Glass Jar - Unpreserved (EP071)</b> MK_SB18_0.1, MK_SB20_0.1, MK_SB26_0.2	MK_SB19_0.1, MK_SB25_0.2	18-OCT-2013	28-OCT-2013	01-NOV-2013	✔	29-OCT-2013	07-DEC-2013	✔
<b>EP074D: Fumigants</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB13_1.0		17-OCT-2013	28-OCT-2013	24-OCT-2013	✖	28-OCT-2013	24-OCT-2013	✖
<b>EP074E: Halogenated Aliphatic Compounds</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB13_1.0		17-OCT-2013	28-OCT-2013	24-OCT-2013	✖	28-OCT-2013	24-OCT-2013	✖
<b>EP074F: Halogenated Aromatic Compounds</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB13_1.0		17-OCT-2013	28-OCT-2013	24-OCT-2013	✖	28-OCT-2013	24-OCT-2013	✖
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB13_1.0		17-OCT-2013	28-OCT-2013	24-OCT-2013	✖	28-OCT-2013	24-OCT-2013	✖
<b>EP074B: Oxygenated Compounds</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB13_1.0		17-OCT-2013	28-OCT-2013	24-OCT-2013	✖	28-OCT-2013	24-OCT-2013	✖
<b>EP074C: Sulfonated Compounds</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB13_1.0		17-OCT-2013	28-OCT-2013	24-OCT-2013	✖	28-OCT-2013	24-OCT-2013	✖



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP074G: Trihalomethanes</b>							
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB13_1.0	17-OCT-2013	28-OCT-2013	24-OCT-2013	✖	28-OCT-2013	24-OCT-2013	✖
<b>EP075(SIM)A: Phenolic Compounds</b>							
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MK_SB13_1.0, MK_SB27_0.2, MK_SB34_0.8, MK_SB28_0.2, MK_SB12_0.2, MK_SB33_1.0, MK_SB35_1.0, MK_SB22_0.5	17-OCT-2013	28-OCT-2013	31-OCT-2013	✔	30-OCT-2013	07-DEC-2013	✔
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MK_SB18_0.1, MK_SB20_0.1, MK_SB26_0.2, MK_SB19_0.1, MK_SB25_0.2	18-OCT-2013	28-OCT-2013	01-NOV-2013	✔	30-OCT-2013	07-DEC-2013	✔
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>							
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MK_SB13_1.0, MK_SB27_0.2, MK_SB34_0.8, MK_SB28_0.2, MK_SB12_0.2, MK_SB33_1.0, MK_SB35_1.0, MK_SB22_0.5	17-OCT-2013	28-OCT-2013	31-OCT-2013	✔	30-OCT-2013	07-DEC-2013	✔
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MK_SB18_0.1, MK_SB20_0.1, MK_SB26_0.2, MK_SB19_0.1, MK_SB25_0.2	18-OCT-2013	28-OCT-2013	01-NOV-2013	✔	30-OCT-2013	07-DEC-2013	✔
<b>EP080: BTEXN</b>							
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB12_0.2, MK_SB33_1.0, MK_SB35_1.0, MK_SB22_0.5, MK_SB27_0.2, MK_SB34_0.8, MK_SB28_0.2	17-OCT-2013	25-OCT-2013	31-OCT-2013	✔	29-OCT-2013	31-OCT-2013	✔
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB13_1.0	17-OCT-2013	28-OCT-2013	31-OCT-2013	✔	28-OCT-2013	31-OCT-2013	✔
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB18_0.1, MK_SB20_0.1, MK_SB26_0.2, MK_SB19_0.1, MK_SB25_0.2	18-OCT-2013	25-OCT-2013	01-NOV-2013	✔	29-OCT-2013	01-NOV-2013	✔





Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB12_0.2, MK_SB33_1.0, MK_SB35_1.0, MK_SB22_0.5	MK_SB27_0.2, MK_SB34_0.8, MK_SB28_0.2,	17-OCT-2013	25-OCT-2013	31-OCT-2013	✓	29-OCT-2013	31-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB13_1.0		17-OCT-2013	28-OCT-2013	31-OCT-2013	✓	28-OCT-2013	31-OCT-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB18_0.1, MK_SB20_0.1, MK_SB26_0.2	MK_SB19_0.1, MK_SB25_0.2,	18-OCT-2013	25-OCT-2013	01-NOV-2013	✓	29-OCT-2013	01-NOV-2013	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Moisture Content	EA055-103	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	2	12	16.7	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	4	31	12.9	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	4	38	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	31	6.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	38	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	31	6.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	38	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	31	6.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	38	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Asbestos Identification in bulk solids	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (2013) Schedule B(3) (Method 506.1)
Volatile Organic Compounds	EP074	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option A - Concentrating)	ORG17A	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

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Work Order : ES1323031  
Client : ENVIRO RESOURCES MANAGEMENT  
Project : 0207423 SYMPHONY



<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.



## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.
- For all matrices, no Matrix Spike outliers occur.

#### Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

Matrix: SOIL

Method Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>						
Soil Glass Jar - Unpreserved MK_SB13_1.0	28-OCT-2013	24-OCT-2013	4	28-OCT-2013	24-OCT-2013	4
<b>EP074B: Oxygenated Compounds</b>						
Soil Glass Jar - Unpreserved MK_SB13_1.0	28-OCT-2013	24-OCT-2013	4	28-OCT-2013	24-OCT-2013	4
<b>EP074C: Sulfonated Compounds</b>						
Soil Glass Jar - Unpreserved MK_SB13_1.0	28-OCT-2013	24-OCT-2013	4	28-OCT-2013	24-OCT-2013	4
<b>EP074D: Fumigants</b>						
Soil Glass Jar - Unpreserved MK_SB13_1.0	28-OCT-2013	24-OCT-2013	4	28-OCT-2013	24-OCT-2013	4
<b>EP074E: Halogenated Aliphatic Compounds</b>						
Soil Glass Jar - Unpreserved MK_SB13_1.0	28-OCT-2013	24-OCT-2013	4	28-OCT-2013	24-OCT-2013	4
<b>EP074F: Halogenated Aromatic Compounds</b>						
Soil Glass Jar - Unpreserved MK_SB13_1.0	28-OCT-2013	24-OCT-2013	4	28-OCT-2013	24-OCT-2013	4
<b>EP074G: Trihalomethanes</b>						
Soil Glass Jar - Unpreserved MK_SB13_1.0	28-OCT-2013	24-OCT-2013	4	28-OCT-2013	24-OCT-2013	4



### ***Outliers : Frequency of Quality Control Samples***

The following report highlights breaches in the Frequency of Quality Control Samples.

- **No Quality Control Sample Frequency Outliers exist.**
-

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

<b>Work Order</b>	: <b>ES1323031</b>		
<b>Client</b>	: <b>ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact Address</b>	: MR JONATHAN LEKAWSKI GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Contact Address</b>	: Barbara Hanna 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: jonathan.lekawski@erm.com	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: 0207423 SYMPHONY	<b>Page</b>	: 1 of 3
<b>Order number</b>	: ----	<b>Quote number</b>	: ES2013ENVRES0370 (SY/278/13 V3)
<b>C-O-C number</b>	: 11726	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b>	: MT. PIPER		
<b>Sampler</b>	: GP		

#### Dates

Date Samples Received : 23-OCT-2013	Issue Date : 25-OCT-2013 14:07
Client Requested Due Date : 31-OCT-2013	Scheduled Reporting Date : <b>31-OCT-2013</b>

#### Delivery Details

Mode of Delivery : Carrier	Temperature : 3.6° C - Ice present
No. of coolers/boxes : 1 HARD	No. of samples received : 20
Security Seal : Intact.	No. of samples analysed : 17

#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Asbestos analysis will be conducted by ALS Newcastle.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Samples MK\_SB33\_0.2 not received by ALS Sydney.**
- **Received an extra samples SB33\_0.15 and SB22\_1.0 placed on hold, Please confirm.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.





## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA200 Asbestos Identification in Soils	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP066 (solids) Polychlorinated Biphenyls by GCMS	SOIL - EP074 (solids) Volatile Organic Compounds	SOIL - S-27 TRH/BTEX/PAH/Phenols/6Metals
ES1323031-001	17-OCT-2013 15:00	MK_SB13_1.0			✓	✓	✓	✓
ES1323031-002	17-OCT-2013 15:00	MK_SB13_0.5		✓				
ES1323031-003	17-OCT-2013 15:00	MK_SB12_0.2		✓	✓			✓
ES1323031-004	17-OCT-2013 15:00	MK_SB27_0.2		✓	✓			✓
ES1323031-006	17-OCT-2013 15:00	MK_SB33_0.5		✓				
ES1323031-007	17-OCT-2013 15:00	MK_SB33_1.0			✓			✓
ES1323031-008	17-OCT-2013 15:00	MK_SB34_0.2		✓				
ES1323031-009	17-OCT-2013 15:00	MK_SB34_0.8			✓			✓
ES1323031-010	17-OCT-2013 15:00	MK_SB35_0.2	✓					
ES1323031-011	17-OCT-2013 15:00	MK_SB35_1.0		✓	✓			✓
ES1323031-012	17-OCT-2013 15:00	MK_SB28_0.2		✓	✓			✓
ES1323031-013	17-OCT-2013 15:00	MK_SB22_0.5		✓	✓			✓
ES1323031-014	18-OCT-2013 15:00	MK_SB18_0.1		✓	✓			✓
ES1323031-015	18-OCT-2013 15:00	MK_SB19_0.1		✓	✓			✓
ES1323031-016	18-OCT-2013 15:00	MK_SB20_0.1		✓	✓			✓
ES1323031-017	18-OCT-2013 15:00	MK_SB25_0.2		✓	✓			✓
ES1323031-018	18-OCT-2013 15:00	MK_SB26_0.2		✓	✓			✓
ES1323031-019	18-OCT-2013 15:00	MK_SB17_0.5		✓				
ES1323031-020	17-OCT-2013 15:00	SB22_1.0	✓					
ES1323031-021	17-OCT-2013 15:00	SB33_0.15	✓					

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
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Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

ERM  
 Sydney  
 Melbourne  
 Brisbane  
 Perth  
 Hunter Valley  
 North Coast  
 Other

Grnd Floor, 33 Saunders Street, Pyrmont, NSW, 2009. (ph) 02 8584 8888 (fax) 02 8584 8800  
 Level 3, Yarra Tower, WTC, 18-38 Siddley Street, Docklands, VIC, 3005. (ph) 03 9696 8011 (fax) 03 9696 8022  
 Level 1, 60 Leichhardt Street, Spring Hill, QLD, 4004. (ph) 07 3839 8393 (fax) 07 3839 8381  
 Level 6, Grain Pool Bld, 172 St Georges Tce, WA, 6850. (ph) 08 9321 5200 (fax) 08 9321 5282  
 53 Bonville Avenue, Thornton, NSW, 2322. (ph) 02 4964 2150 (fax) 02 4964 2152  
 Suite 3/146 Gordon Street, Port Macquarie, NSW, 2444. (ph) 02 6584 7155 (fax) 02 6584 7180

Project No: 0207423  
 Project Name: Symphony  
 Project Location: Mt Piper  
 Project Manager: Jonathan Lekanowski  
 Sampler: Gavin Powell

COC Number  
**A 11726**  
 Laboratory  
**ALS**

Laboratory Number	Sample ID	Sample Depth	Sample Date	Sample Time	Matrix		Preservation		Containers (number/type)	BTEX	TPH (C6-C9 P & J + C10-C38)	Speciated TPH	VOC Scan (USEPA 8260 List)	SVOC Scan (USEPA 8270 List)	OC OP Pesticides	PAH	Phenols	PCB	Metals (dissolved / total)	Asbestos	VOC Scan	HOLD	Other Comments on sample (eg: high voc, highly contaminated, special detection limits etc etc)	
					Water	Soil	Other	Acid																Other
1	MK-SB13-1.0		17/10		X		X		1	X						X	X	X	X	X				
2	MK-SB13-0.5				X		X		2	X						X	X	X	X	X				
3	MK-SB12-0.2				X		X		2	X						X	X	X	X	X				
4	MK-SB22-0.2		17/10		X		X		2	X						X	X	X	X	X				
5	MK-SB33-0.2				X		X		1	X						X	X	X	X	X				
6	MK-SB33-0.5				X		X		1	Rach 45 SB 33 - Dink						X	X	X	X	X				
7	MK-SB33-1.0				X		X		1	X						X	X	X	X	X				
8	MK-SB34-0.2				X		X		1	X						X	X	X	X	X				
9	MK-SB34-0.8				X		X		1	X						X	X	X	X	X				
10	MK-SB35-0.2				X		X		1	X						X	X	X	X	X				
11	MK-SB35-1.0				X		X		2	X						X	X	X	X	X				
12	MK-SB28-0.2	0.2			X		X		2	X						X	X	X	X	X				
13	MK-SB22-0.5		17/10		X		X		2	X						X	X	X	X	X				
14	MK-SB18-0.1		18/10		X		X		2	X						X	X	X	X	X				
15	MK-SB19-0.1				X		X		2	X						X	X	X	X	X				
16	MK-SB20-0.1				X		X		2	X						X	X	X	X	X				
17	MK-SB25-0.2				X		X		2	X						X	X	X	X	X				
18	MK-SB26-0.2				X		X		2	X						X	X	X	X	X				
19	MK-SB17-0.5		18/10		X		X		1	X						X	X	X	X	X				

Environmental Division  
 Sydney  
 Work Order  
**ES1323031**  
  
 Telephone : +61-2-8784 8555

Comments: quote S1278/13, email [symphony.deltawest@erm.com](mailto:symphony.deltawest@erm.com)  
 Relinquished by: Gavin Powell  
 Relinquished by: K. Carlock  
 Date/Time: 24/10/13 1700  
 Date/Time: 24/10/13 1700  
 Date/Time: 24/10/13 19:00  
 Date/Time: 24/10/13 19:00



## CERTIFICATE OF ANALYSIS

<b>Work Order</b>	: <b>ES1323389</b>	Page	: 1 of 4
<b>Client</b>	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
<b>Contact</b>	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
<b>Address</b>	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
<b>Project</b>	: RPROJECT SYMPHONY - MP MT PIPER SOIL	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Order number</b>	: 0207423		
<b>C-O-C number</b>	: ----	<b>Date Samples Received</b>	: 29-OCT-2013
<b>Sampler</b>	: TS/AA	<b>Issue Date</b>	: 01-NOV-2013
<b>Site</b>	: ----		
<b>Quote number</b>	: SY/278/13 V3	<b>No. of samples received</b>	: 4
		<b>No. of samples analysed</b>	: 4

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Raymond Commodor	Instrument Chemist	Sydney Inorganics



### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sample ID	D01_091013_TS	MB_MW04_0.5	ML_MW08_0.5	ML_MW17_0.2	----
Client sampling date / time	09-OCT-2013 15:00	08-OCT-2013 15:00	09-OCT-2013 15:00	14-OCT-2013 15:00	----
Compound	ES1323389-001	ES1323389-002	ES1323389-003	ES1323389-004	----

Compound	CAS Number	LOR	Unit	ES1323389-001	ES1323389-002	ES1323389-003	ES1323389-004	----
<b>EN33: TCLP Leach</b>								
Initial pH	----	0.1	pH Unit	6.8	6.7	6.7	6.6	----
After HCl pH	----	0.1	pH Unit	1.6	1.6	1.6	1.6	----
Extraction Fluid Number	----	1	-	1	1	1	1	----
Final pH	----	0.1	pH Unit	4.9	4.9	4.9	4.9	----





### Analytical Results

Sub-Matrix: TCLP LEACHATE (Matrix: WATER)

Client sample ID

				D01_091013_TS	MB_MW04_0.5	ML_MW08_0.5	ML_MW17_0.2	----
				31-OCT-2013 12:00	31-OCT-2013 12:00	31-OCT-2013 12:00	31-OCT-2013 12:00	----
Compound	CAS Number	LOR	Unit	ES1323389-001	ES1323389-002	ES1323389-003	ES1323389-004	----
<b>EG005C: Leachable Metals by ICPAES</b>								
Nickel	7440-02-0	0.1	mg/L	0.1	<0.1	0.1	<0.1	----

Client sampling date / time

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: ES1323389</b>	<b>Page</b>	<b>: 1 of 4</b>
<b>Client</b>	<b>: ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	<b>: Environmental Division Sydney</b>
<b>Contact</b>	<b>: MR JONATHAN LEKAWSKI</b>	<b>Contact</b>	<b>: Barbara Hanna</b>
<b>Address</b>	<b>: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007</b>	<b>Address</b>	<b>: 277-289 Woodpark Road Smithfield NSW Australia 2164</b>
<b>E-mail</b>	<b>: jonathan.lekawski@erm.com</b>	<b>E-mail</b>	<b>: Barbara.Hanna@alsglobal.com</b>
<b>Telephone</b>	<b>: +61 02 8584 8888</b>	<b>Telephone</b>	<b>: +61 2 8784 8555</b>
<b>Facsimile</b>	<b>: +61 02 8584 8800</b>	<b>Facsimile</b>	<b>: +61 2 8784 8555</b>
<b>Project</b>	<b>: RPROJECT SYMPHONY - MP MT PIPER SOIL</b>	<b>QC Level</b>	<b>: NEPM 2013 Schedule B(3) and ALS QCS3 requirement</b>
<b>Site</b>	<b>: ----</b>	<b>Date Samples Received</b>	<b>: 29-OCT-2013</b>
<b>C-O-C number</b>	<b>: ----</b>	<b>Issue Date</b>	<b>: 01-NOV-2013</b>
<b>Sampler</b>	<b>: TS/AA</b>	<b>No. of samples received</b>	<b>: 4</b>
<b>Order number</b>	<b>: 0207423</b>	<b>No. of samples analysed</b>	<b>: 4</b>
<b>Quote number</b>	<b>: SY/278/13 V3</b>		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

#### Signatories

Celine Conceicao  
Raymond Commodor

#### Position

Senior Spectroscopist  
Instrument Chemist

#### Accreditation Category

Sydney Inorganics  
Sydney Inorganics



### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :            Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
                  CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
                  LOR = Limit of reporting  
                  RPD = Relative Percentage Difference  
                  # = Indicates failed QC



### Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG005C: Leachable Metals by ICPAES (QC Lot: 3134839)</b>									
EM1311175-005	Anonymous	EG005C: Nickel	7440-02-0	0.1	mg/L	<0.1	<0.1	0.0	No Limit
ES1323389-002	MB_MW04_0.5	EG005C: Nickel	7440-02-0	0.1	mg/L	<0.1	<0.1	0.0	No Limit



### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
<b>EG005C: Leachable Metals by ICPAES (QCLot: 3134839)</b>								
EG005C: Nickel	7440-02-0	0.1	mg/L	<0.1	0.1 mg/L	102	83	117

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%) Low High	
<b>EG005C: Leachable Metals by ICPAES (QCLot: 3134839)</b>							
ES1323295-002	Anonymous	EG005C: Nickel	7440-02-0	1 mg/L	117	70	130

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS MSD		Recovery Limits (%) Low High		RPDs (%) Value Control Limit	
<b>EG005C: Leachable Metals by ICPAES (QCLot: 3134839)</b>										
ES1323295-002	Anonymous	EG005C: Nickel	7440-02-0	1 mg/L	117	----	70	130	----	----

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1323389</b>	Page	: 1 of 5
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: RPROJECT SYMPHONY - MP MT PIPER SOIL	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 29-OCT-2013
C-O-C number	: ----	Issue Date	: 01-NOV-2013
Sampler	: TS/AA	No. of samples received	: 4
Order number	: 0207423	No. of samples analysed	: 4
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EG005C: Leachable Metals by ICPAES</b>								
<b>Clear Plastic Bottle - Nitric Acid; Unfiltered (EG005C)</b> D01_091013_TS, ML_MW08_0.5,	MB_MW04_0.5, ML_MW17_0.2	31-OCT-2013	31-OCT-2013	29-APR-2014	✓	31-OCT-2013	29-APR-2014	✓
<b>EN33: TCLP Leach</b>								
<b>Lab Split: Leach for metals excl. Hg (EN33a)</b> MB_MW04_0.5		08-OCT-2013	---	06-APR-2014	----	31-OCT-2013	06-APR-2014	✓
<b>Lab Split: Leach for metals excl. Hg (EN33a)</b> D01_091013_TS,	ML_MW08_0.5	09-OCT-2013	---	07-APR-2014	----	31-OCT-2013	07-APR-2014	✓
<b>Lab Split: Leach for metals excl. Hg (EN33a)</b> ML_MW17_0.2		14-OCT-2013	---	12-APR-2014	----	31-OCT-2013	12-APR-2014	✓





## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Leachable Metals by ICPAES	EG005C	2	10	20.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
Leachable Metals by ICPAES	EG005C	1	10	10.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
Leachable Metals by ICPAES	EG005C	1	10	10.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
Leachable Metals by ICPAES	EG005C	1	10	10.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

<i>Analytical Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Leachable Metals by ICPAES	EG005C	SOIL	APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises leachate sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Digestion for Total Recoverable Metals in TCLP Leachate	EN25C	SOIL	USEPA SW846-3005 Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3) (Appdx. 2)
TCLP for Non & Semivolatile Analytes	EN33a	SOIL	(USEPA SW846-1311, ALS QWI-EN/33) The TCLP procedure is designed to determine the mobility of both organic and inorganic analytes present in wastes. The standard TCLP leach is for non-volatile and Semivolatile test parameters.



---

## Summary of Outliers

### **Outliers : Quality Control Samples**

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### **Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes**

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.
- For all matrices, no Matrix Spike outliers occur.

#### **Regular Sample Surrogates**

- For all regular sample matrices, no surrogate recovery outliers occur.

### **Outliers : Analysis Holding Time Compliance**

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- No Analysis Holding Time Outliers exist.

### **Outliers : Frequency of Quality Control Samples**

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.
-

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

<b>Work Order</b>	: <b>ES1323389</b>		
<b>Client</b>	: <b>ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact Address</b>	: MR JONATHAN LEKAWSKI GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Contact Address</b>	: Barbara Hanna 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: jonathan.lekawski@erm.com	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: RPROJECT SYMPHONY - MP MT PIPER SOIL	<b>Page</b>	: 1 of 2
<b>Order number</b>	: 0207423	<b>Quote number</b>	: ES2013ENVRES0370 (SY/278/13 V3)
<b>C-O-C number</b>	: ----	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b>	: ----		
<b>Sampler</b>	: TS/AA		

#### Dates

Date Samples Received	: 29-OCT-2013	Issue Date	: 30-OCT-2013 15:38
Client Requested Due Date	: 05-NOV-2013	Scheduled Reporting Date	: <b>05-NOV-2013</b>

#### Delivery Details

Mode of Delivery	: Carrier	Temperature	: 4.1°C
No. of coolers/boxes	: REBATCH	No. of samples received	: 4
Security Seal	: Not intact.	No. of samples analysed	: 4

#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **This is a rebatch of ES1322146 and ES1322435.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EG005C Leachable Metals by ICPAES	SOIL - TCLP TCLP Leach
ES1323389-001	09-OCT-2013 15:00	D01_091013_TS	✓	✓
ES1323389-002	08-OCT-2013 15:00	MB_MW04_0.5	✓	✓
ES1323389-003	09-OCT-2013 15:00	ML_MW08_0.5	✓	✓
ES1323389-004	14-OCT-2013 15:00	ML_MW17_0.2	✓	✓

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
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Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

**Fadi Soro**

**From:** Barbara Hanna  
**Sent:** Tuesday, 29 October 2013 4:25 PM  
**To:** Fadi Soro  
**Subject:** FW: 0207423 - TCLPs - ES1322146 and ES1322435

Barbara Hanna

Tuesday, 29 October 2013 4:25 PM

Fadi Soro

FW: 0207423 - TCLPs - ES1322146 and ES1322435

Hi Fadi,

Could you please arrange this rebatch.

Thanks!!

Kind Regards

**Barbara Hanna**

Client Services Manager  
ALS | Environmental Division

277-289 Woodpark Road  
Smithfield NSW 2164 Australia

[How was your customer experience? Please send us your feedback](#)

[Please see our latest EnviroMail 68 - Sampling and Analysis Implications of the new NEPM - July 2013](#)

[EnviroMail 69 - Testing Requirements of the new NEPM - July 2013](#)

[EnviroMail 70 - Variation of Naphthalene by SVOC and VOC Methods in Water - July 2013](#)

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[www.alsglobal.com](http://www.alsglobal.com)

Environmental Division  
Sydney

Work Order

**ES1323389**



Telephone : +61-2-8784 8555

Fadi  
29/10/13  
4:45pm

Winner of the inaugural CARE Award 2011 – Sustainable Technology & Innovation:  
Reduction in Sample Volumes – Improving quality, safety, efficiency and sustainability in environmental practices



Please consider the environment before printing this email.

**From:** Anne Ashworth [mailto:Anne.Ashworth@erm.com]  
**Sent:** Tuesday, 29 October 2013 4:10 PM  
**To:** Barbara Hanna  
**Cc:** Jonathan Lekawski; ERM Australia Project Symphony Delta West  
**Subject:** 0207423 - TCLPs - ES1322146 and ES1322435

Hi Barbara,

Can you please submit the following samples (re-batch) for TCLP for nickel:

Field_ID	Sampled_Date-Time	SampleCode	Lab_Report_Number
1 D01_091013_TS	9/10/2013	ES1322146010	ES1322146 5489-490
2 MB_MW04_0.5	8/10/2013	ES1322146002	ES1322146
3 ML_MW08_0.5	9/10/2013	ES1322146004	ES1322146
4 ML_MW17_0.2	14/10/2013	ES1322435001	ES1322435 5522

Thanks,

Anne

Anne Ashworth  
Environmental Scientist

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*mobile* 0466 017 512

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ALS Group: [Click here](#) to report this email as spam.

## CERTIFICATE OF ANALYSIS

Work Order	: <b>ES1323858</b>	Page	: 1 of 15
Client	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: PROJECT SYMPHONY - MP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 0207423		
C-O-C number	: ----	Date Samples Received	: 05-NOV-2013
Sampler	: T.SHAW	Issue Date	: 14-NOV-2013
Site	: ----		
Quote number	: SY/278/13 V3	No. of samples received	: 18
		No. of samples analysed	: 6

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EA150H: Soil Particle Density required for Hydrometer analysis according to AS 1289.3.5.1-2006 was not requested by the client. Typical sediment SPD values used for calculations and consequently NATA endorsement does not apply to hydrometer results.**
- **EA200 Legend**
- **EA200 'Am' Amosite (brown asbestos)**
- **EA200 'Ch' Chrysotile (white asbestos)**
- **EA200 'Cr' Crocidolite (blue asbestos)**
- **EA200 'Trace' - Asbestos fibres detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres**
- **EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.**
- **EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.**
- **EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.**



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

## Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ashesh Patel	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Christopher Owler	Team Leader - Asbestos	Newcastle - Asbestos
Di-An Dao		Sydney Inorganics
Hamish Murray	Supervisor - Soils	Newcastle - Inorganics
Hoa Nguyen	Senior Inorganic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Inorganics
		Sydney Organics



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time	ML_MW05_2.9	D01_311013_TS	ML_MW08_7.0	MI_SB03_0.2	MI_SB06_0.2
31-OCT-2013 15:00					
	ES1323858-002	ES1323858-004	ES1323858-010	ES1323858-012	ES1323858-014

Compound	CAS Number	LOR	Unit	ES1323858-002	ES1323858-004	ES1323858-010	ES1323858-012	ES1323858-014
----------	------------	-----	------	---------------	---------------	---------------	---------------	---------------

### EA150: Particle Sizing

+75µm	----	1	%	30	----	----	----	----
+150µm	----	1	%	25	----	----	----	----
+300µm	----	1	%	22	----	----	----	----
+425µm	----	1	%	22	----	----	----	----
+600µm	----	1	%	21	----	----	----	----
+1180µm	----	1	%	18	----	----	----	----
+2.36mm	----	1	%	16	----	----	----	----
+4.75mm	----	1	%	12	----	----	----	----
+9.5mm	----	1	%	9	----	----	----	----
+19.0mm	----	1	%	<1	----	----	----	----
+37.5mm	----	1	%	<1	----	----	----	----
+75.0mm	----	1	%	<1	----	----	----	----

### EA002 : pH (Soils)

pH Value	----	0.1	pH Unit	5.4	----	----	----	----
----------	------	-----	---------	-----	------	------	------	------

### EA055: Moisture Content

Moisture Content (dried @ 103°C)	----	1.0	%	18.6	23.3	19.9	13.2	14.3
----------------------------------	------	-----	---	------	------	------	------	------

### EA150: Soil Classification based on Particle Size

Clay (<2 µm)	----	1	%	25	----	----	----	----
Silt (2-60 µm)	----	1	%	44	----	----	----	----
Sand (0.06-2.00 mm)	----	1	%	15	----	----	----	----
Gravel (>2mm)	----	1	%	16	----	----	----	----
Cobbles (>6cm)	----	1	%	<1	----	----	----	----

### EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples

Asbestos Detected	1332-21-4	0.1	g/kg	No	----	----	No	No
Asbestos Type	1332-21-4	0.1	--	-	----	----	-	-
Sample weight (dry)	----	0.01	g	1370	----	----	46.0	332
APPROVED IDENTIFIER:	----	-	--	C.OWLER	----	----	C.OWLER	C.OWLER

### ED008: Exchangeable Cations

Exchangeable Calcium	----	0.1	meq/100g	0.6	----	----	----	----
Exchangeable Magnesium	----	0.1	meq/100g	2.3	----	----	----	----
Exchangeable Potassium	----	0.1	meq/100g	0.4	----	----	----	----
Exchangeable Sodium	----	0.1	meq/100g	0.1	----	----	----	----
Cation Exchange Capacity	----	0.1	meq/100g	3.5	----	----	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_MW05_2.9	D01_311013_TS	ML_MW08_7.0	MI_SB03_0.2	MI_SB06_0.2
				31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	01-NOV-2013 08:20	01-NOV-2013 08:20
Compound	CAS Number	LOR	Unit	ES1323858-002	ES1323858-004	ES1323858-010	ES1323858-012	ES1323858-014
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	<5	<5	7	16	14
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	7	6	15	15	14
Copper	7440-50-8	5	mg/kg	12	13	14	30	19
Lead	7439-92-1	5	mg/kg	20	21	17	24	18
Nickel	7440-02-0	2	mg/kg	10	9	20	73	42
Zinc	7440-66-6	5	mg/kg	31	28	40	90	78
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<b>EP004: Organic Matter</b>								
Organic Matter	----	0.5	%	0.6	----	----	----	----
Total Organic Carbon	----	0.5	%	<0.5	----	----	----	----
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	----	<0.1	<0.1
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	----	<5	<5
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	----	<5	<5
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	----	<5	<5
2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	----	<5	<5
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
<b>EP074D: Fumigants</b>								



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_MW05_2.9	D01_311013_TS	ML_MW08_7.0	MI_SB03_0.2	MI_SB06_0.2
				31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	01-NOV-2013 08:20	01-NOV-2013 08:20
Compound	CAS Number	LOR	Unit	ES1323858-002	ES1323858-004	ES1323858-010	ES1323858-012	ES1323858-014
<b>EP074D: Fumigants - Continued</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	----	<5	<5
Chloromethane	74-87-3	5	mg/kg	<5	<5	----	<5	<5
Vinyl chloride	75-01-4	5	mg/kg	<5	<5	----	<5	<5
Bromomethane	74-83-9	5	mg/kg	<5	<5	----	<5	<5
Chloroethane	75-00-3	5	mg/kg	<5	<5	----	<5	<5
Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	----	<5	<5
1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_MW05_2.9	D01_311013_TS	ML_MW08_7.0	MI_SB03_0.2	MI_SB06_0.2
				31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	01-NOV-2013 08:20	01-NOV-2013 08:20
Compound	CAS Number	LOR	Unit	ES1323858-002	ES1323858-004	ES1323858-010	ES1323858-012	ES1323858-014
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	5	mg/kg	<5	<5	----	<5	<5
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	1.0	0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_MW05_2.9	D01_311013_TS	ML_MW08_7.0	MI_SB03_0.2	MI_SB06_0.2
				31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	01-NOV-2013 08:20	01-NOV-2013 08:20
Compound	CAS Number	LOR	Unit	ES1323858-002	ES1323858-004	ES1323858-010	ES1323858-012	ES1323858-014
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	1.1	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	0.6	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	2.7	0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	1.2	1.2	1.2
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_MW05_2.9	D01_311013_TS	ML_MW08_7.0	MI_SB03_0.2	MI_SB06_0.2
				31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	01-NOV-2013 08:20	01-NOV-2013 08:20
Compound	CAS Number	LOR	Unit	ES1323858-002	ES1323858-004	ES1323858-010	ES1323858-012	ES1323858-014
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	65.6	65.8	----	64.2	68.8
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	Not Determined	99.3	----	104	81.6
Toluene-D8	2037-26-5	0.1	%	117	115	----	108	104
4-Bromofluorobenzene	460-00-4	0.1	%	112	108	----	103	93.0
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	100	102	96.5	99.4	99.5
2-Chlorophenol-D4	93951-73-6	0.1	%	95.6	98.0	96.5	89.4	96.8
2,4,6-Tribromophenol	118-79-6	0.1	%	92.2	88.1	88.3	82.0	86.3
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	95.0	91.9	89.2	90.6	90.7
Anthracene-d10	1719-06-8	0.1	%	83.0	80.2	78.7	78.4	79.4
4-Terphenyl-d14	1718-51-0	0.1	%	86.3	84.2	81.3	82.6	81.9
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	107	104	120	120	94.0
Toluene-D8	2037-26-5	0.1	%	115	113	99.7	99.3	95.2
4-Bromofluorobenzene	460-00-4	0.1	%	113	109	104	101	95.7



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

ML\_MW02\_0.2

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Client sampling date / time

01-NOV-2013 08:20

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Compound	CAS Number	LOR	Unit	ES1323858-017	---	---	---	---
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	---	1.0	%	12.1	---	---	---	---
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	---	---	---	---
Asbestos Type	1332-21-4	0.1	--	-	---	---	---	---
Sample weight (dry)	---	0.01	g	312	---	---	---	---
APPROVED IDENTIFIER:	---	-	--	C.OWLER	---	---	---	---
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	---	---	---	---
Arsenic	7440-38-2	5	mg/kg	93	---	---	---	---
Cadmium	7440-43-9	1	mg/kg	<1	---	---	---	---
Chromium	7440-47-3	2	mg/kg	9	---	---	---	---
Copper	7440-50-8	5	mg/kg	22	---	---	---	---
Lead	7439-92-1	5	mg/kg	25	---	---	---	---
Nickel	7440-02-0	2	mg/kg	15	---	---	---	---
Zinc	7440-66-6	5	mg/kg	59	---	---	---	---
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	---	---	---	---
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	---	0.1	mg/kg	<0.1	---	---	---	---
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	<0.5	---	---	---	---
Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	---	---	---	---
n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	---	---	---	---
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	---	---	---	---
sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	---	---	---	---
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	---	---	---	---
tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	---	---	---	---
p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	---	---	---	---
n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	---	---	---	---
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	<5	---	---	---	---
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	---	---	---	---
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	---	---	---	---



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

ML\_MW02\_0.2

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Client sampling date / time

01-NOV-2013 08:20

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Compound	CAS Number	LOR	Unit	ES1323858-017	---	---	---	---
<b>EP074B: Oxygenated Compounds - Continued</b>								
2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	---	---	---	---
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	---	---	---	---
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	---	---	---	---
1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	---	---	---	---
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	---	---	---	---
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	---	---	---	---
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	---	---	---	---
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	---	---	---	---
Chloromethane	74-87-3	5	mg/kg	<5	---	---	---	---
Vinyl chloride	75-01-4	5	mg/kg	<5	---	---	---	---
Bromomethane	74-83-9	5	mg/kg	<5	---	---	---	---
Chloroethane	75-00-3	5	mg/kg	<5	---	---	---	---
Trichlorofluoromethane	75-69-4	5	mg/kg	<5	---	---	---	---
1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	---	---	---	---
Iodomethane	74-88-4	0.5	mg/kg	<0.5	---	---	---	---
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	---	---	---	---
1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	---	---	---	---
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	---	---	---	---
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	---	---	---	---
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	---	---	---	---
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	---	---	---	---
1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	---	---	---	---
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	---	---	---	---
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	---	---	---	---
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	---	---	---	---
1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	---	---	---	---
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	---	---	---	---
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	---	---	---	---
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	---	---	---	---
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	---	---	---	---



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

ML\_MW02\_0.2

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Client sampling date / time

01-NOV-2013 08:20

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Compound	CAS Number	LOR	Unit	ES1323858-017	---	---	---	---
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	---	---	---	---
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	---	---	---	---
Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	---	---	---	---
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	---	---	---	---
Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	---	---	---	---
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	---	---	---	---
Bromobenzene	108-86-1	0.5	mg/kg	<0.5	---	---	---	---
2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	---	---	---	---
4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	---	---	---	---
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	---	---	---	---
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	---	---	---	---
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	---	---	---	---
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	---	---	---	---
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	---	---	---	---
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	<0.5	---	---	---	---
Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	---	---	---	---
Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	---	---	---	---
Bromoform	75-25-2	0.5	mg/kg	<0.5	---	---	---	---
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	5	mg/kg	<5	---	---	---	---
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	---	---	---	---
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	---	---	---	---
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	---	---	---	---
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	---	---	---	---
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	---	---	---	---
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	---	---	---	---
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	---	---	---	---
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	---	---	---	---
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	---	---	---	---
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	---	---	---	---



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

ML\_MW02\_0.2

Client sampling date / time

01-NOV-2013 08:20

Compound	CAS Number	LOR	Unit	ES1323858-017				
<b>EP075(SIM)A: Phenolic Compounds - Continued</b>								
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	----	----	----	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	----	----	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	----	----	----
Benzo(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	----	----	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	----	----	----
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	----	----	----	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	----	----	----	----
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	----	----	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

ML\_MW02\_0.2

Client sampling date / time

01-NOV-2013 08:20

Compound	CAS Number	LOR	Unit	ES1323858-017				
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 - Continued</b>								
>C16 - C34 Fraction	----	100	mg/kg	<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	----	----	----	----
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	----	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg	<1	----	----	----	----
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	68.2	----	----	----	----
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	93.9	----	----	----	----
Toluene-D8	2037-26-5	0.1	%	108	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	103	----	----	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	106	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	102	----	----	----	----
2,4,6-Tribromophenol	118-79-6	0.1	%	90.4	----	----	----	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	94.6	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%	82.9	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	86.0	----	----	----	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	98.2	----	----	----	----
Toluene-D8	2037-26-5	0.1	%	106	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	104	----	----	----	----





## Analytical Results

### Descriptive Results

Sub-Matrix: **SOIL**

<i>Method: Compound</i>	<i>Client sample ID - Client sampling date / time</i>	<i>Analytical Results</i>
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>		
EA200: Description	ML_MW05_2.9 - 31-OCT-2013 15:00	Pale grey-brown clay soil with some small brown and grey rocks plus some quartz and charcoal grains and a trace of vegetation
EA200: Description	MI_SB03_0.2 - 01-NOV-2013 08:20	Mid grey soil with plenty of grey rocks plus some slag grains and a trace of vegetation
EA200: Description	MI_SB06_0.2 - 01-NOV-2013 08:20	Mid grey soil with plenty of grey rocks plus some slag grains and a trace of vegetation
EA200: Description	ML_MW02_0.2 - 01-NOV-2013 08:20	Pale brown clay soil with some small grey rocks plus some quartz grains and a trace of vegetation



## Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP066S: PCB Surrogate</b>			
Decachlorobiphenyl	2051-24-3	39	149
<b>EP074S: VOC Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	64	130
Toluene-D8	2037-26-5	66	136
4-Bromofluorobenzene	460-00-4	60	122
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

## QUALITY CONTROL REPORT

Work Order	: <b>ES1323858</b>	Page	: 1 of 17
Client	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: PROJECT SYMPHONY - MP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 05-NOV-2013
C-O-C number	: ----	Issue Date	: 14-NOV-2013
Sampler	: T.SHAW	No. of samples received	: 18
Order number	: 0207423	No. of samples analysed	: 6
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :  
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
RPD = Relative Percentage Difference  
# = Indicates failed QC



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

## Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ashesh Patel	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Christopher Owler	Team Leader - Asbestos	Newcastle - Asbestos
Di-An Dao		Sydney Inorganics
Hamish Murray	Supervisor - Soils	Newcastle - Inorganics
Hoa Nguyen	Senior Inorganic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Inorganics Sydney Organics



## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EA002 : pH (Soils) (QC Lot: 3145798)</b>									
ES1323812-058	Anonymous	EA002: pH Value	----	0.1	pH Unit	4.8	4.7	2.5	0% - 20%
ES1324064-001	Anonymous	EA002: pH Value	----	0.1	pH Unit	8.8	8.9	0.0	0% - 20%
<b>EA055: Moisture Content (QC Lot: 3152343)</b>									
ES1323858-012	MI_SB03_0.2	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	13.2	12.2	7.6	0% - 50%
ES1323859-016	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	16.7	16.0	4.7	0% - 50%
<b>ED008: Exchangeable Cations (QC Lot: 3152579)</b>									
EB1327308-011	Anonymous	ED008: Exchangeable Calcium	----	0.1	meq/100g	0.4	0.4	0.0	0% - 20%
		ED008: Exchangeable Magnesium	----	0.1	meq/100g	4.5	4.5	0.0	0% - 20%
		ED008: Exchangeable Potassium	----	0.1	meq/100g	0.1	0.1	0.0	0% - 20%
		ED008: Exchangeable Sodium	----	0.1	meq/100g	0.5	0.5	0.0	0% - 20%
		ED008: Cation Exchange Capacity	----	0.1	meq/100g	5.5	5.5	0.0	0% - 20%
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3151888)</b>									
ES1323840-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	43	36	17.5	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	8	9	15.1	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	18	18	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	8	9	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	21	23	12.2	No Limit
ES1323840-011	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	15	16	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	9	7	20.1	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	5	<5	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	7	7	0.0	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3151889)</b>									
ES1323840-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1323840-011	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP004: Organic Matter (QC Lot: 3147606)</b>									
ES1323275-001	Anonymous	EP004: Organic Matter	----	0.5	%	2.6	2.7	0.0	No Limit
		EP004: Total Organic Carbon	----	0.5	%	1.5	1.6	0.0	No Limit
<b>EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 3144979)</b>									



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report							
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)		
<b>EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 3144979) - continued</b>											
ES1323858-002	ML_MW05_2.9	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit		
ES1323860-022	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit		
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3146003)</b>											
ES1323858-002	ML_MW05_2.9	EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
ES1323860-021	Anonymous	EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
ES1323860-021	Anonymous	EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		<b>EP074B: Oxygenated Compounds (QC Lot: 3146003)</b>									
		ES1323858-002	ML_MW05_2.9	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.0	No Limit
				EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.0	No Limit
				EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.0	No Limit
				EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.0	No Limit
		ES1323860-021	Anonymous	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.0	No Limit
EP074: 2-Butanone (MEK)	78-93-3			5	mg/kg	<5	<5	0.0	No Limit		
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1			5	mg/kg	<5	<5	0.0	No Limit		
EP074: 2-Hexanone (MBK)	591-78-6			5	mg/kg	<5	<5	0.0	No Limit		
<b>EP074C: Sulfonated Compounds (QC Lot: 3146003)</b>											
ES1323858-002	ML_MW05_2.9	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
ES1323860-021	Anonymous	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
<b>EP074D: Fumigants (QC Lot: 3146003)</b>											
ES1323858-002	ML_MW05_2.9	EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
ES1323860-021	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074D: Fumigants (QC Lot: 3146003) - continued</b>									
ES1323860-021	Anonymous	EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3146003)</b>									
ES1323858-002	ML_MW05_2.9	EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.0	No Limit
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.0	No Limit		
ES1323860-021	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit





Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3146003) - continued</b>									
ES1323860-021	Anonymous	EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.0	No Limit
EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.0	No Limit		
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.0	No Limit		
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3146003)</b>									
ES1323858-002	ML_MW05_2.9	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1323860-021	Anonymous	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report							
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)		
<b>EP074G: Trihalomethanes (QC Lot: 3146003)</b>											
ES1323858-002	ML_MW05_2.9	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
ES1323860-021	Anonymous	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
<b>EP074H: Naphthalene (QC Lot: 3146003)</b>											
ES1323858-002	ML_MW05_2.9	EP074: Naphthalene	91-20-3	5	mg/kg	<5	<5	0.0	No Limit		
ES1323860-021	Anonymous	EP074: Naphthalene	91-20-3	5	mg/kg	<5	<5	0.0	No Limit		
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3144510)</b>											
ES1323858-002	ML_MW05_2.9	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit		
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit		
		ES1323862-029	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
				EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2-Methylphenol	95-48-7			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 2-Nitrophenol	88-75-5			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 2.4-Dimethylphenol	105-67-9			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 2.4-Dichlorophenol	120-83-2			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 2.6-Dichlorophenol	87-65-0			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 3- & 4-Methylphenol	1319-77-3			1	mg/kg	<1	<1	0.0	No Limit		
EP075(SIM): Pentachlorophenol	87-86-5			2	mg/kg	<2	<2	0.0	No Limit		
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3144510)</b>											
ES1323858-002	ML_MW05_2.9			EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3144510) - continued</b>									
ES1323858-002	ML_MW05_2.9	EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1323862-029	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3144509)</b>									
ES1323858-002	ML_MW05_2.9	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1323862-029	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3144509) - continued</b>										
ES1323862-029	Anonymous	EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3146002)</b>										
ES1323858-002	ML_MW05_2.9	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit	
ES1323860-021	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3144509)</b>										
ES1323858-002	ML_MW05_2.9	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit	
ES1323862-029	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3146002)</b>										
ES1323858-002	ML_MW05_2.9	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit	
ES1323860-021	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit	
<b>EP080: BTEXN (QC Lot: 3146002)</b>										
ES1323858-002	ML_MW05_2.9	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
ES1323860-021	Anonymous	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit	
		EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			106-42-3							
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit			
EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit			



## Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>ED008: Exchangeable Cations (QCLot: 3152579)</b>									
ED008: Exchangeable Calcium	----	0.1	meq/100g	<0.1	1 meq/100g	105	90	128	
ED008: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	1.67 meq/100g	87.4	86	120	
ED008: Exchangeable Potassium	----	0.1	meq/100g	<0.1	0.51 meq/100g	94.3	85	135	
ED008: Exchangeable Sodium	----	0.1	meq/100g	<0.1	0.87 meq/100g	93.0	86	128	
ED008: Cation Exchange Capacity	----	0.1	meq/100g	<0.1	----	----	----	----	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3151888)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	107	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	101	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	109	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	106	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	102	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	111	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	89.8	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	108	81	133	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3151889)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	83.4	66	112	
<b>EP004: Organic Matter (QCLot: 3147606)</b>									
EP004: Organic Matter	----	0.5	%	<0.5	4.58 %	95.8	85	105	
EP004: Total Organic Carbon	----	0.5	%	<0.5	2.66 %	95.7	84	106	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3144979)</b>									
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	96.0	57.4	117	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3146003)</b>									
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	91.9	64	126	
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	90.6	66	128	
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	85.6	63	129	
EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	86.1	63	129	
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	85.0	64	130	
EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	84.0	63	129	
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	88.6	63	129	
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	86.4	62	130	
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	86.0	61	131	
<b>EP074B: Oxygenated Compounds (QCLot: 3146003)</b>									
EP074: Vinyl Acetate	108-05-4	1	mg/kg	----	10 mg/kg	47.1	29.6	156	
		5	mg/kg	<5	----	----	----	----	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074B: Oxygenated Compounds (QCLot: 3146003) - continued</b>									
EP074: 2-Butanone (MEK)	78-93-3	1	mg/kg	----	10 mg/kg	128	58	136	
		5	mg/kg	<5	----	----	----	----	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	1	mg/kg	----	10 mg/kg	93.5	54	138	
		5	mg/kg	<5	----	----	----	----	
EP074: 2-Hexanone (MBK)	591-78-6	1	mg/kg	----	10 mg/kg	95.6	54	136	
		5	mg/kg	<5	----	----	----	----	
<b>EP074C: Sulfonated Compounds (QCLot: 3146003)</b>									
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	55.4	54	126	
<b>EP074D: Fumigants (QCLot: 3146003)</b>									
EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	80.1	55	133	
EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	89.2	69	127	
EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	73.2	54	124	
EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	66.0	51	125	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	88.0	66	126	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3146003)</b>									
EP074: Dichlorodifluoromethane	75-71-8	1	mg/kg	----	10 mg/kg	45.5	30	148	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloromethane	74-87-3	1	mg/kg	----	10 mg/kg	63.1	41	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Vinyl chloride	75-01-4	1	mg/kg	----	10 mg/kg	61.7	43	147	
		5	mg/kg	<5	----	----	----	----	
EP074: Bromomethane	74-83-9	1	mg/kg	----	10 mg/kg	66.0	47	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloroethane	75-00-3	1	mg/kg	----	10 mg/kg	78.0	49	143	
		5	mg/kg	<5	----	----	----	----	
EP074: Trichlorofluoromethane	75-69-4	1	mg/kg	----	10 mg/kg	79.0	49	135	
		5	mg/kg	<5	----	----	----	----	
EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	81.5	54	126	
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	52.3	43	129	
EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	84.4	62	130	
EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	89.1	66	132	
EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	93.7	66	132	
EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	76.3	62	126	
EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	91.2	64	128	
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	67.5	59	125	
EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	87.9	65	123	
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	92.1	64	120	
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	86.8	65	127	
EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	94.9	70	130	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3146003) - continued</b>									
EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	92.6	72	128	
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	94.6	67	143	
EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	73.8	62	122	
EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	74.0	54	128	
EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	71.2	55	129	
EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	94.0	56	132	
EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	104	65	135	
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	76.8	19.8	134	
EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	85.1	53	129	
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	85.2	48	136	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3146003)</b>									
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	93.8	70	128	
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	83.3	67	127	
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	82.5	64	130	
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	83.3	62	130	
EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	88.0	63	129	
EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	88.9	63	129	
EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	87.3	66	128	
EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	81.5	54	134	
EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	92.8	60	132	
<b>EP074G: Trihalomethanes (QCLot: 3146003)</b>									
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	87.8	62	120	
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	62.4	61	121	
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	79.7	63	121	
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	78.8	60	126	
<b>EP074H: Naphthalene (QCLot: 3146003)</b>									
EP074: Naphthalene	91-20-3	0.5	mg/kg	----	1 mg/kg	89.7	63	133	
		5	mg/kg	<5	----	----	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3144510)</b>									
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	92.8	74	116	
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	89.5	74	116	
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	84.0	72	116	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	84.9	69	123	
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	81.5	60.3	117	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	90.9	69	117	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	84.1	68	112	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	90.2	73	117	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	83.1	76.4	114	





Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3144510) - continued</b>									
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	82.5	57	111	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	83.5	68.9	112	
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	30.1	3.9	57	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3144510)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	98.6	80	124	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	84.5	77	123	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	88.6	79	123	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	87.6	77	123	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	89.9	79	123	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	90.4	79	123	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	89.0	79	123	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	91.0	79	125	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	81.1	73	121	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	88.3	81	123	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	83.8	70	118	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	91.1	77	123	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	86.7	76	122	
EP075(SIM): Indeno(1,2,3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	81.6	71	113	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	84.4	71.7	113	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	84.5	72.4	114	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3144509)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	92.2	71	131	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	91.1	74	138	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	84.1	64	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3146002)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	82.9	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3144509)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	93.8	70	130	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	88.0	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	
		50	mg/kg	----	150 mg/kg	71.9	63	131	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3146002)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	80.9	68.4	128	
<b>EP080: BTEXN (QCLot: 3146002)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	89.0	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	85.5	62	128	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	83.2	58	118	



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
<b>EP080: BTEXN (QCLot: 3146002) - continued</b>								
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	87.6	60	120
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	92.9	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	92.6	62	138

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%) Low High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3151888)</b>							
ES1323840-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	89.9	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	102	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	76.3	70	130
		EG005T: Copper	7440-50-8	125 mg/kg	96.0	70	130
		EG005T: Lead	7439-92-1	125 mg/kg	102	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	99.7	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	94.0	70	130
		EG005T: Zinc	7440-66-6	125 mg/kg	102	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3151889)</b>							
ES1323840-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	96.4	70	130
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3144979)</b>							
ES1323858-002	ML_MW05_2.9	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	93.0	70	130
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3146003)</b>							
ES1323858-002	ML_MW05_2.9	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	106	70	130
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	93.6	70	130
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3146003)</b>							
ES1323858-002	ML_MW05_2.9	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	97.3	70	130
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3144510)</b>							
ES1323858-002	ML_MW05_2.9	EP075(SIM): Phenol	108-95-2	10 mg/kg	93.9	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	90.7	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	79.1	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	76.6	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	51.9	20	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3144510)</b>							



Sub-Matrix: SOIL

				Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3144510) - continued</b>							
ES1323858-002	ML_MW05_2.9	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	86.9	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	87.6	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3144509)</b>							
ES1323858-002	ML_MW05_2.9	EP071: C10 - C14 Fraction	----	640 mg/kg	86.0	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	82.6	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	71.3	52	132
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3146002)</b>							
ES1323858-002	ML_MW05_2.9	EP080: C6 - C9 Fraction	----	32.5 mg/kg	95.1	70	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3144509)</b>							
ES1323858-002	ML_MW05_2.9	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	104	73	137
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	75.4	53	131
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	54.2	52	132
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3146002)</b>							
ES1323858-002	ML_MW05_2.9	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	88.1	70	130
<b>EP080: BTEXN (QCLot: 3146002)</b>							
ES1323858-002	ML_MW05_2.9	EP080: Benzene	71-43-2	2.5 mg/kg	89.8	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	87.5	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	86.6	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	89.9	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	92.2	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	92.6	70	130

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3144509)</b>										
ES1323858-002	ML_MW05_2.9	EP071: C10 - C14 Fraction	----	640 mg/kg	86.0	----	73	137	----	----
		EP071: C15 - C28 Fraction	----	3140 mg/kg	82.6	----	53	131	----	----
		EP071: C29 - C36 Fraction	----	2860 mg/kg	71.3	----	52	132	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3144509)</b>										
ES1323858-002	ML_MW05_2.9	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	104	----	73	137	----	----
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	75.4	----	53	131	----	----



Sub-Matrix: SOIL

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
					MS	MSD	Low	High	Value	Control Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3144509) - continued</b>											
ES1323858-002	ML_MW05_2.9	EP071: >C34 - C40 Fraction	----	2400 mg/kg	54.2	----	52	132	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3144510)</b>											
ES1323858-002	ML_MW05_2.9	EP075(SIM): Phenol	108-95-2	10 mg/kg	93.9	----	70	130	----	----	
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	90.7	----	70	130	----	----	
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	79.1	----	60	130	----	----	
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	76.6	----	70	130	----	----	
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	51.9	----	20	130	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3144510)</b>											
ES1323858-002	ML_MW05_2.9	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	86.9	----	70	130	----	----	
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	87.6	----	70	130	----	----	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3144979)</b>											
ES1323858-002	ML_MW05_2.9	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	93.0	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3146002)</b>											
ES1323858-002	ML_MW05_2.9	EP080: C6 - C9 Fraction	----	32.5 mg/kg	95.1	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3146002)</b>											
ES1323858-002	ML_MW05_2.9	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	88.1	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3146002)</b>											
ES1323858-002	ML_MW05_2.9	EP080: Benzene	71-43-2	2.5 mg/kg	89.8	----	70	130	----	----	
		EP080: Toluene	108-88-3	2.5 mg/kg	87.5	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	86.6	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	89.9	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	92.2	----	70	130	----	----	
	91-20-3	EP080: Naphthalene		2.5 mg/kg	92.6	----	70	130	----	----	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3146003)</b>											
ES1323858-002	ML_MW05_2.9	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	106	----	70	130	----	----	
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	93.6	----	70	130	----	----	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3146003)</b>											
ES1323858-002	ML_MW05_2.9	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	97.3	----	70	130	----	----	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3151888)</b>											
ES1323840-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	89.9	----	70	130	----	----	
		EG005T: Cadmium	7440-43-9	50 mg/kg	102	----	70	130	----	----	
		EG005T: Chromium	7440-47-3	50 mg/kg	76.3	----	70	130	----	----	
		EG005T: Copper	7440-50-8	125 mg/kg	96.0	----	70	130	----	----	
		EG005T: Lead	7439-92-1	125 mg/kg	102	----	70	130	----	----	
		EG005T: Nickel	7440-02-0	50 mg/kg	99.7	----	70	130	----	----	
		EG005T: Selenium	7782-49-2	50 mg/kg	94.0	----	70	130	----	----	

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 Work Order : ES1323858  
 Client : ENVIRO RESOURCES MANAGEMENT  
 Project : PROJECT SYMPHONY - MP



Sub-Matrix: **SOIL**

				<i>Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report</i>							
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>Spike</i>	<i>Spike Recovery (%)</i>		<i>Recovery Limits (%)</i>		<i>RPDs (%)</i>		
				<i>Concentration</i>	<i>MS</i>	<i>MSD</i>	<i>Low</i>	<i>High</i>	<i>Value</i>	<i>Control Limit</i>	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3151888) - continued</b>											
ES1323840-001	Anonymous	EG005T: Zinc	7440-66-6	125 mg/kg	102	----	70	130	----	----	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3151889)</b>											
ES1323840-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	96.4	----	70	130	----	----	

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1323858</b>	Page	: 1 of 10
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: PROJECT SYMPHONY - MP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 05-NOV-2013
C-O-C number	: ----	Issue Date	: 14-NOV-2013
Sampler	: T.SHAW	No. of samples received	: 18
Order number	: 0207423	No. of samples analysed	: 6
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EA002 : pH (Soils)</b>							
<b>Soil Glass Jar - Unpreserved (EA002)</b> ML_MW05_2.9	31-OCT-2013	07-NOV-2013	07-NOV-2013	✓	07-NOV-2013	07-NOV-2013	✓
<b>EA055: Moisture Content</b>							
<b>Soil Glass Jar - Unpreserved (EA055-103)</b> MI_SB03_0.2, ML_MW02_0.2	MI_SB06_0.2, 01-NOV-2013	----	----	----	11-NOV-2013	15-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EA055-103)</b> ML_MW05_2.9, ML_MW08_7.0	D01_311013_TS, 31-OCT-2013	----	----	----	11-NOV-2013	14-NOV-2013	✓
<b>EA150: Particle Sizing</b>							
<b>Snap Lock Bag (EA150H)</b> ML_MW05_2.9	31-OCT-2013	---	29-APR-2014	----	13-NOV-2013	29-APR-2014	✓
<b>EA150: Soil Classification based on Particle Size</b>							
<b>Snap Lock Bag (EA150H)</b> ML_MW05_2.9	31-OCT-2013	---	29-APR-2014	----	13-NOV-2013	29-APR-2014	✓
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>							
<b>Snap Lock Bag (EA200)</b> MI_SB03_0.2, ML_MW02_0.2	MI_SB06_0.2, 01-NOV-2013	---	30-APR-2014	----	14-NOV-2013	13-MAY-2014	✓
<b>Snap Lock Bag (EA200)</b> ML_MW05_2.9	31-OCT-2013	---	29-APR-2014	----	14-NOV-2013	13-MAY-2014	✓
<b>ED008: Exchangeable Cations</b>							
<b>Soil Glass Jar - Unpreserved (ED008)</b> ML_MW05_2.9	31-OCT-2013	12-NOV-2013	28-NOV-2013	✓	12-NOV-2013	28-NOV-2013	✓
<b>EG005T: Total Metals by ICP-AES</b>							
<b>Soil Glass Jar - Unpreserved (EG005T)</b> MI_SB03_0.2, ML_MW02_0.2	MI_SB06_0.2, 01-NOV-2013	11-NOV-2013	30-APR-2014	✓	12-NOV-2013	30-APR-2014	✓
<b>Soil Glass Jar - Unpreserved (EG005T)</b> ML_MW05_2.9, ML_MW08_7.0	D01_311013_TS, 31-OCT-2013	11-NOV-2013	29-APR-2014	✓	12-NOV-2013	29-APR-2014	✓





Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Soil Glass Jar - Unpreserved (EG035T) MI_SB03_0.2, ML_MW02_0.2	MI_SB06_0.2,	01-NOV-2013	11-NOV-2013	29-NOV-2013	✓	12-NOV-2013	29-NOV-2013	✓
Soil Glass Jar - Unpreserved (EG035T) ML_MW05_2.9, ML_MW08_7.0	D01_311013_TS,	31-OCT-2013	11-NOV-2013	28-NOV-2013	✓	12-NOV-2013	28-NOV-2013	✓
<b>EP004: Organic Matter</b>								
Soil Glass Jar - Unpreserved (EP004) ML_MW05_2.9		31-OCT-2013	08-NOV-2013	28-NOV-2013	✓	08-NOV-2013	28-NOV-2013	✓
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Soil Glass Jar - Unpreserved (EP066) MI_SB03_0.2, ML_MW02_0.2	MI_SB06_0.2,	01-NOV-2013	07-NOV-2013	15-NOV-2013	✓	08-NOV-2013	17-DEC-2013	✓
Soil Glass Jar - Unpreserved (EP066) ML_MW05_2.9,	D01_311013_TS	31-OCT-2013	07-NOV-2013	14-NOV-2013	✓	08-NOV-2013	17-DEC-2013	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
Soil Glass Jar - Unpreserved (EP071) MI_SB03_0.2, ML_MW02_0.2	MI_SB06_0.2,	01-NOV-2013	06-NOV-2013	15-NOV-2013	✓	07-NOV-2013	16-DEC-2013	✓
Soil Glass Jar - Unpreserved (EP071) ML_MW05_2.9, ML_MW08_7.0	D01_311013_TS,	31-OCT-2013	06-NOV-2013	14-NOV-2013	✓	07-NOV-2013	16-DEC-2013	✓
<b>EP074D: Fumigants</b>								
Soil Glass Jar - Unpreserved (EP074) MI_SB03_0.2, ML_MW02_0.2	MI_SB06_0.2,	01-NOV-2013	07-NOV-2013	08-NOV-2013	✓	07-NOV-2013	08-NOV-2013	✓
Soil Glass Jar - Unpreserved (EP074) ML_MW05_2.9,	D01_311013_TS	31-OCT-2013	07-NOV-2013	07-NOV-2013	✓	07-NOV-2013	07-NOV-2013	✓
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Soil Glass Jar - Unpreserved (EP074) MI_SB03_0.2, ML_MW02_0.2	MI_SB06_0.2,	01-NOV-2013	07-NOV-2013	08-NOV-2013	✓	07-NOV-2013	08-NOV-2013	✓
Soil Glass Jar - Unpreserved (EP074) ML_MW05_2.9,	D01_311013_TS	31-OCT-2013	07-NOV-2013	07-NOV-2013	✓	07-NOV-2013	07-NOV-2013	✓
<b>EP074F: Halogenated Aromatic Compounds</b>								
Soil Glass Jar - Unpreserved (EP074) MI_SB03_0.2, ML_MW02_0.2	MI_SB06_0.2,	01-NOV-2013	07-NOV-2013	08-NOV-2013	✓	07-NOV-2013	08-NOV-2013	✓
Soil Glass Jar - Unpreserved (EP074) ML_MW05_2.9,	D01_311013_TS	31-OCT-2013	07-NOV-2013	07-NOV-2013	✓	07-NOV-2013	07-NOV-2013	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Soil Glass Jar - Unpreserved (EP074) MI_SB03_0.2, ML_MW02_0.2	MI_SB06_0.2,	01-NOV-2013	07-NOV-2013	08-NOV-2013	✓	07-NOV-2013	08-NOV-2013	✓
Soil Glass Jar - Unpreserved (EP074) ML_MW05_2.9,	D01_311013_TS	31-OCT-2013	07-NOV-2013	07-NOV-2013	✓	07-NOV-2013	07-NOV-2013	✓
<b>EP074H: Naphthalene</b>								
Soil Glass Jar - Unpreserved (EP074) MI_SB03_0.2, ML_MW02_0.2	MI_SB06_0.2,	01-NOV-2013	07-NOV-2013	08-NOV-2013	✓	07-NOV-2013	08-NOV-2013	✓
Soil Glass Jar - Unpreserved (EP074) ML_MW05_2.9,	D01_311013_TS	31-OCT-2013	07-NOV-2013	07-NOV-2013	✓	07-NOV-2013	07-NOV-2013	✓
<b>EP074B: Oxygenated Compounds</b>								
Soil Glass Jar - Unpreserved (EP074) MI_SB03_0.2, ML_MW02_0.2	MI_SB06_0.2,	01-NOV-2013	07-NOV-2013	08-NOV-2013	✓	07-NOV-2013	08-NOV-2013	✓
Soil Glass Jar - Unpreserved (EP074) ML_MW05_2.9,	D01_311013_TS	31-OCT-2013	07-NOV-2013	07-NOV-2013	✓	07-NOV-2013	07-NOV-2013	✓
<b>EP074C: Sulfonated Compounds</b>								
Soil Glass Jar - Unpreserved (EP074) MI_SB03_0.2, ML_MW02_0.2	MI_SB06_0.2,	01-NOV-2013	07-NOV-2013	08-NOV-2013	✓	07-NOV-2013	08-NOV-2013	✓
Soil Glass Jar - Unpreserved (EP074) ML_MW05_2.9,	D01_311013_TS	31-OCT-2013	07-NOV-2013	07-NOV-2013	✓	07-NOV-2013	07-NOV-2013	✓
<b>EP074G: Trihalomethanes</b>								
Soil Glass Jar - Unpreserved (EP074) MI_SB03_0.2, ML_MW02_0.2	MI_SB06_0.2,	01-NOV-2013	07-NOV-2013	08-NOV-2013	✓	07-NOV-2013	08-NOV-2013	✓
Soil Glass Jar - Unpreserved (EP074) ML_MW05_2.9,	D01_311013_TS	31-OCT-2013	07-NOV-2013	07-NOV-2013	✓	07-NOV-2013	07-NOV-2013	✓
<b>EP075(SIM)A: Phenolic Compounds</b>								
Soil Glass Jar - Unpreserved (EP075(SIM)) MI_SB03_0.2, ML_MW02_0.2	MI_SB06_0.2,	01-NOV-2013	06-NOV-2013	15-NOV-2013	✓	07-NOV-2013	16-DEC-2013	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) ML_MW05_2.9, ML_MW08_7.0	D01_311013_TS,	31-OCT-2013	06-NOV-2013	14-NOV-2013	✓	07-NOV-2013	16-DEC-2013	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MI_SB03_0.2, ML_MW02_0.2	MI_SB06_0.2,	01-NOV-2013	06-NOV-2013	15-NOV-2013	✓	07-NOV-2013	16-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> ML_MW05_2.9, ML_MW08_7.0	D01_311013_TS,	31-OCT-2013	06-NOV-2013	14-NOV-2013	✓	07-NOV-2013	16-DEC-2013	✓
<b>EP080: BTEXN</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b> MI_SB03_0.2, ML_MW02_0.2	MI_SB06_0.2,	01-NOV-2013	07-NOV-2013	15-NOV-2013	✓	07-NOV-2013	15-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> ML_MW05_2.9, ML_MW08_7.0	D01_311013_TS,	31-OCT-2013	07-NOV-2013	14-NOV-2013	✓	07-NOV-2013	14-NOV-2013	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b> MI_SB03_0.2, ML_MW02_0.2	MI_SB06_0.2,	01-NOV-2013	07-NOV-2013	15-NOV-2013	✓	07-NOV-2013	15-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> ML_MW05_2.9, ML_MW08_7.0	D01_311013_TS,	31-OCT-2013	07-NOV-2013	14-NOV-2013	✓	07-NOV-2013	14-NOV-2013	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Exchangeable Cations with pre-treatment	ED008	1	3	33.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Moisture Content	EA055-103	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organic Matter	EP004	1	6	16.7	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	18	11.1	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
pH (1:5)	EA002	2	13	15.4	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	2	12	16.7	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	18	11.1	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
Exchangeable Cations with pre-treatment	ED008	1	3	33.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organic Matter	EP004	1	6	16.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
Exchangeable Cations with pre-treatment	ED008	1	3	33.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organic Matter	EP004	1	6	16.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
Organic Matter	EP004	1	6	16.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



Matrix: **SOIL** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Matrix Spikes (MS) - Continued</b>							
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH (1:5)	EA002	SOIL	(APHA 21st ed., 4500H+) pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM (2013) Schedule B(3) (Method 103)
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Particle Size Analysis by Hydrometer	EA150H	SOIL	Particle Size Analysis by Hydrometer according to AS1289.3.6.3 - 2003
Asbestos Identification in bulk solids	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples
Exchangeable Cations with pre-treatment	ED008	SOIL	Rayment & Higginson (1992) Method 15A2. Soluble salts are removed from the sample prior to analysis. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. This method is compliant with NEPM (2013) Schedule B(3) (Method 301)
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Organic Matter	EP004	SOIL	AS1289.4.1.1 - 1997., Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM (2013) Schedule B(3) (Method 105)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (2013) Schedule B(3) (Method 506.1)
Volatile Organic Compounds	EP074	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
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Preparation Methods	Method	Matrix	Method Descriptions
Exchangeable Cations Preparation Method	ED007PR	SOIL	Rayment & Higginson (1992) method 15A1. A 1M NH <sub>4</sub> Cl extraction by end over end tumbling at a ratio of 1:20. There is no pretreatment for soluble salts. Extracts can be run by ICP for cations.
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of distilled water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Organic Matter	EP004-PR	SOIL	AS1289.4.1.1 - 1997., Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM (2013) Schedule B(3) (Method 105)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option A - Concentrating)	ORG17A	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.





## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.
- For all matrices, no Matrix Spike outliers occur.

#### Regular Sample Surrogates

Sub-Matrix: SOIL

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Samples Submitted</b>							
EP074S: VOC Surrogates	ES1323858-002	ML_MW05_2.9	1,2-Dichloroethane-D4	17060-07-0	Not Determined	----	Surrogate recovery not determined due to (target or non-target) matrix interferences

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- No Analysis Holding Time Outliers exist.

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

<b>Work Order</b> : <b>ES1323858</b>	
<b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : MR JONATHAN LEKAWSKI <b>Address</b> : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Laboratory</b> : Environmental Division Sydney  <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b> : jonathan.lekawski@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800	<b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555
<b>Project</b> : PROJECT SYMPHONY - MP <b>Order number</b> : 0207423 <b>C-O-C number</b> : ---- <b>Site</b> : ---- <b>Sampler</b> : T.SHAW	<b>Page</b> : 1 of 3  <b>Quote number</b> : ES2013ENVRES0370 (SY/278/13 V3)  <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement

#### Dates

<b>Date Samples Received</b> : 05-NOV-2013 <b>Client Requested Due Date</b> : 14-NOV-2013	<b>Issue Date</b> : 06-NOV-2013 13:17 <b>Scheduled Reporting Date</b> : <b>14-NOV-2013</b>
--	---

#### Delivery Details

<b>Mode of Delivery</b> : Carrier <b>No. of coolers/boxes</b> : 7 HARD <b>Security Seal</b> : Intact.	<b>Temperature</b> : 5°C - Ice present <b>No. of samples received</b> : 18 <b>No. of samples analysed</b> : 6
---	---

#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Asbestos and PSD analysis will be conducted by ALS Newcastle.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Sample T01\_311013\_TS will be forwarded to Envirolab as per COC.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



### Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- No sample container / preservation non-compliance exist.

### Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA002 pH (1:5)	SOIL - EA150H Particle Sizing by Hydrometer	SOIL - EA200 Asbestos Identification in Soils	SOIL - ED008 Def Exchangeable Cations with pre-treatment Default	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP004 (Carbon) Total Organic Carbon (Calc.)	SOIL - EP066 (solids) Polychlorinated Biphenyls by GCMS
ES1323858-001	31-OCT-2013 15:00	ML_MW05_2.0	✓							
ES1323858-002	31-OCT-2013 15:00	ML_MW05_2.9		✓	✓	✓	✓	✓	✓	✓
ES1323858-003	31-OCT-2013 15:00	ML_MW05_5.0	✓							
ES1323858-004	31-OCT-2013 15:00	D01_311013_TS					✓			✓
ES1323858-005	31-OCT-2013 15:00	ML_MW05_6.0	✓							
ES1323858-006	31-OCT-2013 15:00	ML_MW08_2.0	✓							
ES1323858-007	31-OCT-2013 15:00	ML_MW08_2.6	✓							
ES1323858-008	31-OCT-2013 15:00	ML_MW08_2.8	✓							
ES1323858-009	31-OCT-2013 15:00	ML_MW08_3.9	✓							
ES1323858-010	31-OCT-2013 15:00	ML_MW08_7.0					✓			
ES1323858-011	31-OCT-2013 15:00	ML_MW08_7.9	✓							
ES1323858-012	01-NOV-2013 08:20	MI_SB03_0.2				✓	✓			✓
ES1323858-013	01-NOV-2013 08:20	MI_SB03_0.5	✓							
ES1323858-014	01-NOV-2013 08:20	MI_SB06_0.2				✓	✓			✓
ES1323858-015	01-NOV-2013 08:20	MI_SB06_0.55	✓							
ES1323858-016	01-NOV-2013 08:20	MI_SB06_1.0	✓							
ES1323858-017	01-NOV-2013 08:20	ML_MW02_0.2				✓	✓			✓
ES1323858-018	01-NOV-2013 15:00	MI_SB02_0.2	✓							

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EP074 (solids) Volatile Organic Compounds	SOIL - S-Z7 TRH/BTEXN/PAH/Phenols/8Metals
ES1323858-002	31-OCT-2013 15:00	ML_MW05_2.9	✓	✓
ES1323858-004	31-OCT-2013 15:00	D01_311013_TS	✓	✓
ES1323858-010	31-OCT-2013 15:00	ML_MW08_7.0		✓
ES1323858-012	01-NOV-2013 08:20	MI_SB03_0.2	✓	✓
ES1323858-014	01-NOV-2013 08:20	MI_SB06_0.2	✓	✓
ES1323858-017	01-NOV-2013 08:20	ML_MW02_0.2	✓	✓



## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

### Requested Deliverables

#### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

#### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Attachment - Report ( SUBCO )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com

#### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Attachment - Report ( SUBCO )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
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Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com

#### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com



**CHAIN OF CUSTODY**  
ALS Laboratory  
please tick →

DADELAKE 21 Burns Road Beira SA 5005  
Ph: 08 9390 0800 E: [info@alslab.com](mailto:info@alslab.com)  
DEERLAK 23 Silver Street Silver QLD 4063  
Ph: 07 5543 7222 E: [samples@alslab.com](mailto:samples@alslab.com)  
DILLONSHIRE 46 Callinonnan Drive Cinnamon QLD 4860  
Ph: 07 7411 5800 E: [giesterson@alslab.com](mailto:giesterson@alslab.com)

DMACKAY 78 Harbour Road Mackay QLD 4740  
Ph: 07 4944 0177 E: [meesey@alslab.com](mailto:meesey@alslab.com)  
DUNEDIN 24 Watral Road Springfield VIC 3171  
Ph: 03 8949 9000 E: [samples.melbourne@alslab.com](mailto:samples.melbourne@alslab.com)  
DUNDEE 27 Sydney Road Dundee NSW 2850  
Ph: 02 6372 6735 E: [judgden@alslab.com](mailto:judgden@alslab.com)

DUNCASTLE 5 Beece Gum Road Westbrook NSW 2204  
Ph: 02 4908 5433 E: [samples.newcastle@alslab.com](mailto:samples.newcastle@alslab.com)  
DUNOBYA 4/13 Gony Place North Murrumbidgee NSW 2541  
Ph: 024423 2065 E: [rowe@alslab.com](mailto:rowe@alslab.com)  
DUPERT 10 Had Way Malaga WA 0080  
Ph: 09 9200 7655 E: [samples.perth@alslab.com](mailto:samples.perth@alslab.com)

**Environmental Division**  
Sydney  
Work Order  
**ES1323858**



Telephone : + 61-2-9784 8555

**CLIENT:** ERM  
**OFFICE:** Sydney  
**PROJECT:** Project Symphony - MP  
**ORDER NUMBER:** 0207423  
**PROJECT MANAGER:** Jonathan Latakawaki  
**SAMPLER:** Ravone Shay / Gavin Powell  
**COC emailed to:** ALS1 ( YES / NO )  
**EDD FORMAT (or default):** pdf/csv/xdcl  
**Email Reports to (will default to PM if no other addresses are listed):** Symphony.DeltaWest@erm.com  
**Email Invoice to (will default to PM if no other addresses are listed):** Symphony.DeltaWest@erm.com

**TURNAROUND REQUIREMENTS:**  Standard TAT (last due date):  
(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)  Non Standard or urgent TAT (last due date):  
ALS QUOTE NO.: SYZ727813

**CONTACT PH:**  
**SAMPLER MOBILE:** 0925 960 035  
**RELINQUISHED BY:** Ravone Shay  
**DATE/TIME:** 04.11.13/12:00

**RECEIVED BY:** Steven  
**DATE/TIME:** 5/11/13 9:00

**RELINQUISHED BY:**  
**DATE/TIME:**

**COC SEQUENCE NUMBER (Circle)**  
COC: 1 2 3 4 5 6 7  
OF: 1 2 3 4 5 6 7

**FOR LABORATORY USE ONLY:**  
Customer Seal/Label  
Received by (Name)  
Received on (Date)  
Random Sample ID  
Other comments

**COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:**

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below)	TOTAL CONTAINERS (refer to	ANALYSIS REQUIRED INCLUDING SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).										Additional Information
						S-27 (8 metals- As, Cd, Cr, Cu, Ni, Pb, Zn, Hg, TRH/BTEX, PAH/Phenols)	Additional Metal - Se	TRH / BTEX / PAH / Phenol	Asbestos	VOC Scan	PCB	Particle Sizing (hydrometer), TOC -	pH, Exchangeable Cations plus ECEC			
1	ML-MWDS-2.0	31.10.13	Soil	1 jar, 1 bag / ICE	2	X	X	X	X	X	X	X	X	X	HOLD	
2	ML-MWDS-2.9			1 jar, 2 bags / ICE	3	X	X	X	X	X	X	X	X	X		
3	ML-MWDS-5.0			1 jar	1	X	X	X	X	X	X	X	X	X		
4	D01-311013-T5			1 jar	1	X	X	X	X	X	X	X	X	X		
5	T01-311013-T5			2 jars	2	X	X	X	X	X	X	X	X	X		
6	ML-MWDS-6.0			large bag	1	X	X	X	X	X	X	X	X	X	HOLD	
7	ML-MWDS-2.0			1 jar	1	X	X	X	X	X	X	X	X	X	HOLD	
8	ML-MWDS-2.6			1 jar	1	X	X	X	X	X	X	X	X	X	HOLD	
9	ML-MWDS-2.8			1 jar	1	X	X	X	X	X	X	X	X	X	HOLD	
10	ML-MWDS-3.9			1 jar	1	X	X	X	X	X	X	X	X	X	HOLD	
11	ML-MWDS-7.0			1 jar	1	X	X	X	X	X	X	X	X	X	HOLD	
12	ML-MWDS-7.9			1 jar	1	X	X	X	X	X	X	X	X	X	HOLD	
<b>TOTAL</b>					16	4	4	4	4	1	3	3	1	1		

**Water Container Codes:** P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airflight Unpreserved Plastic; V = VOA Vial NQ Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airflight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Special bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Aside Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Solids; B = Unpreserved Bag.







## CERTIFICATE OF ANALYSIS

Work Order	: <b>ES1323859</b>	Page	: 1 of 18
Client	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: PROJECT SYMPHONY - MP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 0207423		
C-O-C number	: ----	Date Samples Received	: 05-NOV-2013
Sampler	: TS	Issue Date	: 15-NOV-2013
Site	: ----		
Quote number	: SY/278/13 V3	No. of samples received	: 18
		No. of samples analysed	: 12

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EA150H: Soil Particle Density required for Hydrometer analysis according to AS 1289.3.5.1-2006 was not requested by the client. Typical sediment SPD values used for calculations and consequently NATA endorsement does not apply to hydrometer results.**
- **EA200 Legend**
- **EA200 'Am' Amosite (brown asbestos)**
- **EA200 'Ch' Chrysotile (white asbestos)**
- **EA200 'Cr' Crocidolite (blue asbestos)**
- **EA200 'Trace' - Asbestos fibres detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres**
- **EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.**
- **EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.**
- **EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.**
- **EP080/EP074: Samples not received in a suitable timeframe to conduct the analysis XXX within the recommended holding time.**



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Christopher Owler	Team Leader - Asbestos	Newcastle - Asbestos
Di-An Dao		Sydney Inorganics
Hamish Murray	Supervisor - Soils	Newcastle - Inorganics
Hoa Nguyen	Senior Inorganic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_MW10_1.6	ML_MW03_1.7	ML_MW03_1.7-2.0	MF_MW03_0.2	MF_MW02_0.1
				29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323859-002	ES1323859-005	ES1323859-006	ES1323859-007	ES1323859-008
<b>EA150: Particle Sizing</b>								
+75µm	----	1	%	----	----	20	----	----
+150µm	----	1	%	----	----	16	----	----
+300µm	----	1	%	----	----	15	----	----
+425µm	----	1	%	----	----	15	----	----
+600µm	----	1	%	----	----	14	----	----
+1180µm	----	1	%	----	----	14	----	----
+2.36mm	----	1	%	----	----	12	----	----
+4.75mm	----	1	%	----	----	9	----	----
+9.5mm	----	1	%	----	----	5	----	----
+19.0mm	----	1	%	----	----	<1	----	----
+37.5mm	----	1	%	----	----	<1	----	----
+75.0mm	----	1	%	----	----	<1	----	----
<b>EA002 : pH (Soils)</b>								
pH Value	----	0.1	pH Unit	----	----	4.4	----	----
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	24.2	22.2	----	20.1	15.2
<b>EA150: Soil Classification based on Particle Size</b>								
Clay (<2 µm)	----	1	%	----	----	31	----	----
Silt (2-60 µm)	----	1	%	----	----	49	----	----
Sand (0.06-2.00 mm)	----	1	%	----	----	9	----	----
Gravel (>2mm)	----	1	%	----	----	11	----	----
Cobbles (>6cm)	----	1	%	----	----	<1	----	----
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	----	----	----	No	No
Asbestos Type	1332-21-4	0.1	--	----	----	----	-	-
Sample weight (dry)	----	0.01	g	----	----	----	488	504
APPROVED IDENTIFIER:	----	-	--	----	----	----	C.OWLER	C.OWLER
<b>ED008: Exchangeable Cations</b>								
Exchangeable Calcium	----	0.1	meq/100g	----	----	1.2	----	----
Exchangeable Magnesium	----	0.1	meq/100g	----	----	4.0	----	----
Exchangeable Potassium	----	0.1	meq/100g	----	----	0.2	----	----
Exchangeable Sodium	----	0.1	meq/100g	----	----	<0.1	----	----
Cation Exchange Capacity	----	0.1	meq/100g	----	----	5.5	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_MW10_1.6	ML_MW03_1.7	ML_MW03_1.7-2.0	MF_MW03_0.2	MF_MW02_0.1
				29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323859-002	ES1323859-005	ES1323859-006	ES1323859-007	ES1323859-008
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	----	<5	<5
Arsenic	7440-38-2	5	mg/kg	5	11	----	9	19
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	<1	<1
Chromium	7440-47-3	2	mg/kg	10	10	----	5	8
Copper	7440-50-8	5	mg/kg	10	18	----	15	23
Lead	7439-92-1	5	mg/kg	15	27	----	19	22
Nickel	7440-02-0	2	mg/kg	9	26	----	56	66
Zinc	7440-66-6	5	mg/kg	38	46	----	138	125
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	<0.1	<0.1
<b>EP004: Organic Matter</b>								
Organic Matter	----	0.5	%	----	----	2.3	----	----
Total Organic Carbon	----	0.5	%	----	----	1.4	----	----
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	----	----	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	----	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	----	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	----	----	----
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	----	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	----	----	----
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	----	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	----	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	----	----	----
n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	----	----	----
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	----	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	----	----	----
2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	----	----	----
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	----	----	----
<b>EP074D: Fumigants</b>								



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_MW10_1.6	ML_MW03_1.7	ML_MW03_1.7-2.0	MF_MW03_0.2	MF_MW02_0.1
				29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323859-002	ES1323859-005	ES1323859-006	ES1323859-007	ES1323859-008
<b>EP074D: Fumigants - Continued</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	----	----	----
1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	----	----	----
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	----	----	----
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	----	----	----
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	----	----	----
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	----	----	----
Chloromethane	74-87-3	5	mg/kg	<5	<5	----	----	----
Vinyl chloride	75-01-4	5	mg/kg	<5	<5	----	----	----
Bromomethane	74-83-9	5	mg/kg	<5	<5	----	----	----
Chloroethane	75-00-3	5	mg/kg	<5	<5	----	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	----	----	----
1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	----	----	----
Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	----	----	----
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	----	----	----
1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	----	----	----
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	----	----	----
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	----	----	----
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	----	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	----	----	----
1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	----	----	----
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	----	----	----
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	----	----	----
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	----	----	----
1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	----	----	----
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	----	----	----
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	----	----	----
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	----	----	----
1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	----	----	----
1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	----	----	----
Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	----	----	----
1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	----	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_MW10_1.6	ML_MW03_1.7	ML_MW03_1.7-2.0	MF_MW03_0.2	MF_MW02_0.1
				29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323859-002	ES1323859-005	ES1323859-006	ES1323859-007	ES1323859-008
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	----	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	----	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	----	----	----
1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	----	----	----
1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	----	----	----
1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	----	----	----
1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	----	----	----
1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	----	----	----
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	----	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	----	----	----
Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	----	----	----
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	5	mg/kg	<5	<5	----	----	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	----	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	----	<2	<2
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_MW10_1.6	ML_MW03_1.7	ML_MW03_1.7-2.0	MF_MW03_0.2	MF_MW02_0.1
				29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323859-002	ES1323859-005	ES1323859-006	ES1323859-007	ES1323859-008
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	----	<b>1.0</b>	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	----	<b>0.6</b>	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	----	<b>1.6</b>	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	----	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	----	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	----	<b>160</b>	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	----	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	----	<b>160</b>	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	----	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	----	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	----	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	----	<b>170</b>	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	----	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	----	<b>170</b>	<50
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_MW10_1.6	ML_MW03_1.7	ML_MW03_1.7-2.0	MF_MW03_0.2	MF_MW02_0.1
				29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323859-002	ES1323859-005	ES1323859-006	ES1323859-007	ES1323859-008
<b>EP080: BTEXN - Continued</b>								
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	----	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	----	<1	<1
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	67.0	67.2	----	----	----
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	94.5	87.9	----	----	----
Toluene-D8	2037-26-5	0.1	%	102	90.7	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	92.2	89.1	----	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	84.5	88.5	----	77.0	90.5
2-Chlorophenol-D4	93951-73-6	0.1	%	83.9	89.6	----	79.7	92.7
2,4,6-Tribromophenol	118-79-6	0.1	%	95.3	92.4	----	78.7	93.2
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	93.2	93.6	----	81.9	94.2
Anthracene-d10	1719-06-8	0.1	%	89.3	87.0	----	73.6	87.5
4-Terphenyl-d14	1718-51-0	0.1	%	86.1	83.1	----	71.7	83.7
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	109	103	----	95.3	92.0
Toluene-D8	2037-26-5	0.1	%	93.8	83.6	----	97.5	94.7
4-Bromofluorobenzene	460-00-4	0.1	%	90.8	88.2	----	92.2	94.9





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MF_MW01_0.2	MF_MW04_0.2	D01_301013_TS	MF_MW05_0.2	MB_MW02_0.5
				30-OCT-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323859-009	ES1323859-010	ES1323859-011	ES1323859-012	ES1323859-013
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	20.0	15.8	13.1	14.5	----
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	----	No	No
Asbestos Type	1332-21-4	0.1	--	-	-	----	-	-
Sample weight (dry)	----	0.01	g	385	324	----	431	158
APPROVED IDENTIFIER:	----	-	--	C.OWLER	C.OWLER	----	C.OWLER	C.OWLER
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	----
Arsenic	7440-38-2	5	mg/kg	22	13	11	11	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	----
Chromium	7440-47-3	2	mg/kg	6	8	11	9	----
Copper	7440-50-8	5	mg/kg	18	16	16	16	----
Lead	7439-92-1	5	mg/kg	22	20	17	18	----
Nickel	7440-02-0	2	mg/kg	104	60	45	59	----
Zinc	7440-66-6	5	mg/kg	118	76	70	103	----
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MF_MW01_0.2	MF_MW04_0.2	D01_301013_TS	MF_MW05_0.2	MB_MW02_0.5
				30-OCT-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323859-009	ES1323859-010	ES1323859-011	ES1323859-012	ES1323859-013
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<b>0.5</b>	<b>0.7</b>	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<b>0.5</b>	<b>0.7</b>	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	----
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	----
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	----
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MF_MW01_0.2	MF_MW04_0.2	D01_301013_TS	MF_MW05_0.2	MB_MW02_0.5
				30-OCT-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323859-009	ES1323859-010	ES1323859-011	ES1323859-012	ES1323859-013
<b>EP080: BTEXN - Continued</b>								
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	94.8	87.6	88.9	82.7	----
2-Chlorophenol-D4	93951-73-6	0.1	%	98.0	88.6	87.8	82.9	----
2.4.6-Tribromophenol	118-79-6	0.1	%	89.1	91.6	93.9	86.4	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	94.6	94.6	94.4	88.6	----
Anthracene-d10	1719-06-8	0.1	%	88.3	89.2	89.8	82.6	----
4-Terphenyl-d14	1718-51-0	0.1	%	83.3	85.4	85.8	79.4	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	97.1	119	99.5	110	----
Toluene-D8	2037-26-5	0.1	%	91.5	122	104	121	----
4-Bromofluorobenzene	460-00-4	0.1	%	94.7	119	101	108	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MI_SB05_0.2	MI_SB02_0.2	----	----	----
				30-OCT-2013 15:00	30-OCT-2013 15:00	----	----	----
Compound	CAS Number	LOR	Unit	ES1323859-016	ES1323859-018	----	----	----
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	16.7	12.1	----	----	----
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	----	----	----
Asbestos Type	1332-21-4	0.1	--	-	-	----	----	----
Sample weight (dry)	----	0.01	g	279	204	----	----	----
APPROVED IDENTIFIER:	----	-	--	C.OWLER	C.OWLER	----	----	----
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	----	----	----
Arsenic	7440-38-2	5	mg/kg	16	40	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	8	12	----	----	----
Copper	7440-50-8	5	mg/kg	14	18	----	----	----
Lead	7439-92-1	5	mg/kg	16	34	----	----	----
Nickel	7440-02-0	2	mg/kg	9	30	----	----	----
Zinc	7440-66-6	5	mg/kg	20	36	----	----	----
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	0.1	----	----	----
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	----	----	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	----	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	----	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	----	----	----
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	----	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	----	----	----
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	----	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	----	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	----	----	----
n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	----	----	----
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	----	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	----	----	----



**Analytical Results**

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MI_SB05_0.2	MI_SB02_0.2	---	---	---
				30-OCT-2013 15:00	30-OCT-2013 15:00	---	---	---
Compound	CAS Number	LOR	Unit	ES1323859-016	ES1323859-018	---	---	---
<b>EP074B: Oxygenated Compounds - Continued</b>								
2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	---	---	---
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	---	---	---
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	---	---	---
1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	---	---	---
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	---	---	---
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	---	---	---
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	---	---	---
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	---	---	---
Chloromethane	74-87-3	5	mg/kg	<5	<5	---	---	---
Vinyl chloride	75-01-4	5	mg/kg	<5	<5	---	---	---
Bromomethane	74-83-9	5	mg/kg	<5	<5	---	---	---
Chloroethane	75-00-3	5	mg/kg	<5	<5	---	---	---
Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	---	---	---
1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	---	---	---
Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	---	---	---
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	---	---	---
1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	---	---	---
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	---	---	---
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	---	---	---
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	---	---	---
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	---	---	---
1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	---	---	---
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	---	---	---
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	---	---	---
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	---	---	---
1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	---	---	---
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	---	---	---
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	---	---	---
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	---	---	---
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	---	---	---



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				MI_SB05_0.2	MI_SB02_0.2	---	---	---
				30-OCT-2013 15:00	30-OCT-2013 15:00	---	---	---
				ES1323859-016	ES1323859-018	---	---	---
Compound	CAS Number	LOR	Unit					
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	---	---	---
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	---	---	---
Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	---	---	---
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	---	---	---
Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	---	---	---
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	---	---	---
Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	---	---	---
2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	---	---	---
4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	---	---	---
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	---	---	---
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	---	---	---
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	---	---	---
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	---	---	---
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	---	---	---
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	---	---	---
Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	---	---	---
Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	---	---	---
Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	---	---	---
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	5	mg/kg	<5	<5	---	---	---
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	---	---	---
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	---	---	---
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	---	---	---
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	---	---	---
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	---	---	---
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	---	---	---
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	---	---	---
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	---	---	---
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	---	---	---
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	---	---	---



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MI_SB05_0.2	MI_SB02_0.2	---	---	---
				30-OCT-2013 15:00	30-OCT-2013 15:00	---	---	---
Compound	CAS Number	LOR	Unit	ES1323859-016	ES1323859-018	---	---	---
<b>EP075(SIM)A: Phenolic Compounds - Continued</b>								
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	---	---	---
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	---	---	---
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	---	---	---
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	---	---	---
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	---	---	---
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	---	---	---
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	---	---	---
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	---	---	---
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	---	---	---
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	---	---	---
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	---	---	---
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	---	---	---
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	---	---	---
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	---	---	---
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	---	---	---
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	---	---	---
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	---	---	---
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	---	---	---
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	---	---	---
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	---	---	---
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	---	---	---
C10 - C14 Fraction	----	50	mg/kg	<50	<50	---	---	---
C15 - C28 Fraction	----	100	mg/kg	<100	<100	---	---	---
C29 - C36 Fraction	----	100	mg/kg	<100	<100	---	---	---
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	---	---	---
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	---	---	---
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	---	---	---
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	---	---	---
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	---	---	---
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	---	---	---



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				MI_SB05_0.2	MI_SB02_0.2	---	---	---
				30-OCT-2013 15:00	30-OCT-2013 15:00	---	---	---
Compound	CAS Number	LOR	Unit	ES1323859-016	ES1323859-018	---	---	---
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft - Continued</b>								
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	---	---	---
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	---	---	---
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	---	---	---
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	---	---	---
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	---	---	---
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	---	---	---
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	---	---	---
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	---	---	---
Naphthalene	91-20-3	1	mg/kg	<1	<1	---	---	---
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	62.9	61.5	---	---	---
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	97.4	104	---	---	---
Toluene-D8	2037-26-5	0.1	%	95.8	105	---	---	---
4-Bromofluorobenzene	460-00-4	0.1	%	90.5	99.8	---	---	---
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	91.8	83.8	---	---	---
2-Chlorophenol-D4	93951-73-6	0.1	%	94.0	93.6	---	---	---
2,4,6-Tribromophenol	118-79-6	0.1	%	90.7	89.6	---	---	---
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	93.2	91.8	---	---	---
Anthracene-d10	1719-06-8	0.1	%	87.0	86.5	---	---	---
4-Terphenyl-d14	1718-51-0	0.1	%	82.7	82.7	---	---	---
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	112	121	---	---	---
Toluene-D8	2037-26-5	0.1	%	88.4	96.6	---	---	---
4-Bromofluorobenzene	460-00-4	0.1	%	91.0	93.2	---	---	---





## Analytical Results

### Descriptive Results

Sub-Matrix: **SOIL**

<i>Method: Compound</i>	<i>Client sample ID - Client sampling date / time</i>	<i>Analytical Results</i>
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>		
EA200: Description	MF_MW03_0.2 - 30-OCT-2013 15:00	Dark grey soil with some coal and slag grains plus a trace of vegetation
EA200: Description	MF_MW02_0.1 - 30-OCT-2013 15:00	Mid grey soil with some grey rocks plus some quartz and slag grains and a trace of vegetation
EA200: Description	MF_MW01_0.2 - 30-OCT-2013 15:00	Mid grey clay soil with some grey rocks plus some quartz grains and a trace of vegetation
EA200: Description	MF_MW04_0.2 - 30-OCT-2013 15:00	Mid grey clay soil with some grey rocks plus some quartz grains and a trace of vegetation
EA200: Description	MF_MW05_0.2 - 30-OCT-2013 15:00	Mid grey clay soil with some grey rocks plus some quartz and coal grains and a trace of vegetation
EA200: Description	MB_MW02_0.5 - 30-OCT-2013 15:00	Pale cream soil with some coal and quartz grains plus a trace of vegetation
EA200: Description	MI_SB05_0.2 - 30-OCT-2013 15:00	Pale brown clay soil with some brown and grey rocks plus a trace of vegetation
EA200: Description	MI_SB02_0.2 - 30-OCT-2013 15:00	Pale brown clay soil with some brown and grey rocks plus a trace of vegetation



## Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP066S: PCB Surrogate</b>			
Decachlorobiphenyl	2051-24-3	39	149
<b>EP074S: VOC Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	64	130
Toluene-D8	2037-26-5	66	136
4-Bromofluorobenzene	460-00-4	60	122
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

## QUALITY CONTROL REPORT

Work Order	: <b>ES1323859</b>	Page	: 1 of 19
Client	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
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Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: PROJECT SYMPHONY - MP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 05-NOV-2013
C-O-C number	: ----	Issue Date	: 15-NOV-2013
Sampler	: TS	No. of samples received	: 18
Order number	: 0207423	No. of samples analysed	: 12
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :  
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
RPD = Relative Percentage Difference  
# = Indicates failed QC



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

## Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Christopher Owler	Team Leader - Asbestos	Newcastle - Asbestos
Di-An Dao		Sydney Inorganics
Hamish Murray	Supervisor - Soils	Newcastle - Inorganics
Hoa Nguyen	Senior Inorganic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics



### Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EA002 : pH (Soils) (QC Lot: 3144634)</b>									
ES1323821-001	Anonymous	EA002: pH Value	----	0.1	pH Unit	8.3	8.3	0.0	0% - 20%
<b>EA055: Moisture Content (QC Lot: 3152343)</b>									
ES1323858-012	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	13.2	12.2	7.6	0% - 50%
ES1323859-016	MI_SB05_0.2	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	16.7	16.0	4.7	0% - 50%
<b>ED008: Exchangeable Cations (QC Lot: 3152579)</b>									
EB1327308-011	Anonymous	ED008: Exchangeable Calcium	----	0.1	meq/100g	0.4	0.4	0.0	0% - 20%
		ED008: Exchangeable Magnesium	----	0.1	meq/100g	4.5	4.5	0.0	0% - 20%
		ED008: Exchangeable Potassium	----	0.1	meq/100g	0.1	0.1	0.0	0% - 20%
		ED008: Exchangeable Sodium	----	0.1	meq/100g	0.5	0.5	0.0	0% - 20%
		ED008: Cation Exchange Capacity	----	0.1	meq/100g	5.5	5.5	0.0	0% - 20%
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3151888)</b>									
ES1323840-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	43	36	17.5	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	8	9	15.1	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	18	18	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	8	9	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	21	23	12.2	No Limit
ES1323840-011	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	15	16	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	9	7	20.1	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	5	<5	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	7	7	0.0	No Limit
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3151890)</b>									
ES1323859-008	MF_MW02_0.1	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	8	6	31.1	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	66	76	13.3	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	19	18	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	23	18	24.2	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	22	22	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3151890) - continued</b>									
ES1323859-008	MF_MW02_0.1	EG005T: Zinc	7440-66-6	5	mg/kg	125	110	13.3	0% - 20%
ES1323943-003	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	2	2	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	5	6	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	3	3	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	20	22	5.6	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	12	13	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	121	122	1.3	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	164	162	1.2	0% - 20%
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3151889)</b>									
ES1323840-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1323840-011	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3151891)</b>									
ES1323859-008	MF_MW02_0.1	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP004: Organic Matter (QC Lot: 3147606)</b>									
ES1323275-001	Anonymous	EP004: Organic Matter	----	0.5	%	2.6	2.7	0.0	No Limit
		EP004: Total Organic Carbon	----	0.5	%	1.5	1.6	0.0	No Limit
<b>EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 3144979)</b>									
ES1323858-002	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1323860-022	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3146003)</b>									
ES1323858-002	Anonymous	EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1323860-021	Anonymous	EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074B: Oxygenated Compounds (QC Lot: 3146003)</b>									
ES1323858-002	Anonymous	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.0	No Limit
ES1323860-021	Anonymous	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.0	No Limit
<b>EP074C: Sulfonated Compounds (QC Lot: 3146003)</b>									
ES1323858-002	Anonymous	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1323860-021	Anonymous	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074D: Fumigants (QC Lot: 3146003)</b>									
ES1323858-002	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1323860-021	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3146003)</b>									
ES1323858-002	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3146003) - continued</b>									
ES1323858-002	Anonymous	EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.0	No Limit
ES1323860-021	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.0	No Limit

**EP074F: Halogenated Aromatic Compounds (QC Lot: 3146003)**





Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3146003) - continued</b>									
ES1323858-002	Anonymous	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1323860-021	Anonymous	EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1323860-021	Anonymous	EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1323860-021	Anonymous	EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Naphthalene	91-20-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Naphthalene	91-20-3	5	mg/kg	<5	<5	0.0	No Limit
<b>EP074H: Naphthalene (QC Lot: 3146003)</b>									
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3144556)</b>									
ES1323840-001	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3144556) - continued</b>									
ES1323840-001	Anonymous	EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
ES1323859-012	MF_MW05_0.2	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3144556)</b>									
ES1323840-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1,2,3-cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
ES1323859-012	MF_MW05_0.2	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	0.7	<0.5	28.4	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3144556) - continued</b>									
ES1323859-012	MF_MW05_0.2	EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	0.7	<0.5	33.3	No Limit
EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3144555)</b>									
ES1323840-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1323859-012	MF_MW05_0.2	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3146002)</b>									
ES1323858-002	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1323860-021	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3146017)</b>									
ES1323859-007	MF_MW03_0.2	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1323861-004	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3144555)</b>									
ES1323840-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
ES1323859-012	MF_MW05_0.2	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3146002)</b>									
ES1323858-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES1323860-021	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3146017)</b>									
ES1323859-007	MF_MW03_0.2	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3146017) - continued</b>									
ES1323861-004	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3146002)</b>									
ES1323858-002	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES1323860-021	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3146017)</b>									
ES1323859-007	MF_MW03_0.2	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES1323861-004	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit



### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>ED008: Exchangeable Cations (QCLot: 3152579)</b>									
ED008: Exchangeable Calcium	----	0.1	meq/100g	<0.1	1 meq/100g	105	90	128	
ED008: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	1.67 meq/100g	87.4	86	120	
ED008: Exchangeable Potassium	----	0.1	meq/100g	<0.1	0.51 meq/100g	94.3	85	135	
ED008: Exchangeable Sodium	----	0.1	meq/100g	<0.1	0.87 meq/100g	93.0	86	128	
ED008: Cation Exchange Capacity	----	0.1	meq/100g	<0.1	----	----	----	----	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3151888)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	107	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	101	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	109	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	106	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	102	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	111	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	89.8	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	108	81	133	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3151890)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	105	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	101	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	122	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	126	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	107	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	130	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	104	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	117	81	133	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3151889)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	83.4	66	112	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3151891)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	83.3	66	112	
<b>EP004: Organic Matter (QCLot: 3147606)</b>									
EP004: Organic Matter	----	0.5	%	<0.5	4.58 %	95.8	85	105	
EP004: Total Organic Carbon	----	0.5	%	<0.5	2.66 %	95.7	84	106	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3144979)</b>									
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	96.0	57.4	117	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3146003)</b>									
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	91.9	64	126	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3146003) - continued</b>									
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	90.6	66	128	
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	85.6	63	129	
EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	86.1	63	129	
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	85.0	64	130	
EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	84.0	63	129	
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	88.6	63	129	
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	86.4	62	130	
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	86.0	61	131	
<b>EP074B: Oxygenated Compounds (QCLot: 3146003)</b>									
EP074: Vinyl Acetate	108-05-4	1	mg/kg	----	10 mg/kg	47.1	29.6	156	
		5	mg/kg	<5	----	----	----	----	
EP074: 2-Butanone (MEK)	78-93-3	1	mg/kg	----	10 mg/kg	128	58	136	
		5	mg/kg	<5	----	----	----	----	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	1	mg/kg	----	10 mg/kg	93.5	54	138	
		5	mg/kg	<5	----	----	----	----	
EP074: 2-Hexanone (MBK)	591-78-6	1	mg/kg	----	10 mg/kg	95.6	54	136	
		5	mg/kg	<5	----	----	----	----	
<b>EP074C: Sulfonated Compounds (QCLot: 3146003)</b>									
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	55.4	54	126	
<b>EP074D: Fumigants (QCLot: 3146003)</b>									
EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	80.1	55	133	
EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	89.2	69	127	
EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	73.2	54	124	
EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	66.0	51	125	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	88.0	66	126	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3146003)</b>									
EP074: Dichlorodifluoromethane	75-71-8	1	mg/kg	----	10 mg/kg	45.5	30	148	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloromethane	74-87-3	1	mg/kg	----	10 mg/kg	63.1	41	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Vinyl chloride	75-01-4	1	mg/kg	----	10 mg/kg	61.7	43	147	
		5	mg/kg	<5	----	----	----	----	
EP074: Bromomethane	74-83-9	1	mg/kg	----	10 mg/kg	66.0	47	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloroethane	75-00-3	1	mg/kg	----	10 mg/kg	78.0	49	143	
		5	mg/kg	<5	----	----	----	----	
EP074: Trichlorofluoromethane	75-69-4	1	mg/kg	----	10 mg/kg	79.0	49	135	
		5	mg/kg	<5	----	----	----	----	
EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	81.5	54	126	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3146003) - continued</b>									
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	52.3	43	129	
EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	84.4	62	130	
EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	89.1	66	132	
EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	93.7	66	132	
EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	76.3	62	126	
EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	91.2	64	128	
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	67.5	59	125	
EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	87.9	65	123	
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	92.1	64	120	
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	86.8	65	127	
EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	94.9	70	130	
EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	92.6	72	128	
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	94.6	67	143	
EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	73.8	62	122	
EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	74.0	54	128	
EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	71.2	55	129	
EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	94.0	56	132	
EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	104	65	135	
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	76.8	19.8	134	
EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	85.1	53	129	
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	85.2	48	136	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3146003)</b>									
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	93.8	70	128	
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	83.3	67	127	
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	82.5	64	130	
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	83.3	62	130	
EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	88.0	63	129	
EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	88.9	63	129	
EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	87.3	66	128	
EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	81.5	54	134	
EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	92.8	60	132	
<b>EP074G: Trihalomethanes (QCLot: 3146003)</b>									
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	87.8	62	120	
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	62.4	61	121	
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	79.7	63	121	
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	78.8	60	126	
<b>EP074H: Naphthalene (QCLot: 3146003)</b>									
EP074: Naphthalene	91-20-3	0.5	mg/kg	----	1 mg/kg	89.7	63	133	
		5	mg/kg	<5	----	----	----	----	





Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3144556)</b>									
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	97.3	74	116	
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	95.3	74	116	
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	106	72	116	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	110	69	123	
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	76.4	60.3	117	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	98.9	69	117	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	86.8	68	112	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	93.1	73	117	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	91.4	76.4	114	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	84.9	57	111	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	83.8	68.9	112	
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	29.0	3.9	57	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3144556)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	101	80	124	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	112	77	123	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	110	79	123	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	111	77	123	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	102	79	123	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	100	79	123	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	102	79	123	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	104	79	125	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	99.3	73	121	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	105	81	123	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	98.8	70	118	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	111	77	123	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	99.1	76	122	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	97.4	71	113	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	98.3	71.7	113	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	95.8	72.4	114	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3144555)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	90.8	71	131	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	91.1	74	138	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	86.2	64	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3146002)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	82.9	68.4	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3146017)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	97.5	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3144555)</b>									





Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	High
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3144555) - continued</b>									
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	89.8	70	130	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	89.7	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	
		50	mg/kg	----	150 mg/kg	81.8	63	131	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3146002)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	80.9	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3146017)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	96.8	68.4	128	
<b>EP080: BTEXN (QCLot: 3146002)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	89.0	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	85.5	62	128	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	83.2	58	118	
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	87.6	60	120	
	106-42-3								
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	92.9	60	120	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	92.6	62	138	
<b>EP080: BTEXN (QCLot: 3146017)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	90.6	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	92.7	62	128	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	92.1	58	118	
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	88.6	60	120	
	106-42-3								
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	90.0	60	120	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	89.4	62	138	

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report				
				Spike Concentration	Spike Recovery(%)		Recovery Limits (%)	
					MS	Low	High	High
<b>EG005T: Total Metals by ICP-AES (QCLot: 3151888)</b>								
ES1323840-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	89.9	70	130	
		EG005T: Cadmium	7440-43-9	50 mg/kg	102	70	130	
		EG005T: Chromium	7440-47-3	50 mg/kg	76.3	70	130	
		EG005T: Copper	7440-50-8	125 mg/kg	96.0	70	130	
		EG005T: Lead	7439-92-1	125 mg/kg	102	70	130	



Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EG005T: Total Metals by ICP-AES (QCLot: 3151888) - continued</b>							
ES1323840-001	Anonymous	EG005T: Nickel	7440-02-0	50 mg/kg	99.7	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	94.0	70	130
		EG005T: Zinc	7440-66-6	125 mg/kg	102	70	130
<b>EG005T: Total Metals by ICP-AES (QCLot: 3151890)</b>							
ES1323859-008	MF_MW02_0.1	EG005T: Arsenic	7440-38-2	50 mg/kg	106	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	98.4	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	98.8	70	130
		EG005T: Copper	7440-50-8	125 mg/kg	101	70	130
		EG005T: Lead	7439-92-1	125 mg/kg	97.8	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	70.4	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	103	70	130
		EG005T: Zinc	7440-66-6	125 mg/kg	73.9	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3151889)</b>							
ES1323840-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	96.4	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3151891)</b>							
ES1323859-008	MF_MW02_0.1	EG035T: Mercury	7439-97-6	5 mg/kg	96.8	70	130
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3144979)</b>							
ES1323858-002	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	93.0	70	130
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3146003)</b>							
ES1323858-002	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	106	70	130
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	93.6	70	130
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3146003)</b>							
ES1323858-002	Anonymous	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	97.3	70	130
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3144556)</b>							
ES1323840-001	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	85.3	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	84.4	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	75.0	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	82.5	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	32.3	20	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3144556)</b>							
ES1323840-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	91.7	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	99.6	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3144555)</b>							
ES1323840-001	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	78.2	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	78.5	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	69.7	52	132



Sub-Matrix: SOIL

				Matrix Spike (MS) Report				
				Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3146002)</b>								
ES1323858-002	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	95.1	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3146017)</b>								
ES1323859-007	MF_MW03_0.2	EP080: C6 - C9 Fraction	----	32.5 mg/kg	96.3	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3144555)</b>								
ES1323840-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	97.4	73	137	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	72.6	53	131	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	54.6	52	132	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3146002)</b>								
ES1323858-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	88.1	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3146017)</b>								
ES1323859-007	MF_MW03_0.2	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	90.8	70	130	
<b>EP080: BTEXN (QCLot: 3146002)</b>								
ES1323858-002	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	89.8	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	87.5	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	86.6	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	89.9	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	92.2	70	130	
	EP080: Naphthalene	91-20-3	2.5 mg/kg	92.6	70	130		
<b>EP080: BTEXN (QCLot: 3146017)</b>								
ES1323859-007	MF_MW03_0.2	EP080: Benzene	71-43-2	2.5 mg/kg	80.4	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	94.8	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	87.0	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	84.3	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	86.9	70	130	
	EP080: Naphthalene	91-20-3	2.5 mg/kg	82.0	70	130		

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3144555)</b>										
ES1323840-001	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	78.2	----	73	137	----	----



Sub-Matrix: SOIL

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
					MS	MSD	Low	High	Value	Control Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3144555) - continued</b>											
ES1323840-001	Anonymous	EP071: C15 - C28 Fraction	----	3140 mg/kg	78.5	----	53	131	----	----	
		EP071: C29 - C36 Fraction	----	2860 mg/kg	69.7	----	52	132	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3144555)</b>											
ES1323840-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	97.4	----	73	137	----	----	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	72.6	----	53	131	----	----	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	54.6	----	52	132	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3144556)</b>											
ES1323840-001	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	85.3	----	70	130	----	----	
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	84.4	----	70	130	----	----	
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	75.0	----	60	130	----	----	
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	82.5	----	70	130	----	----	
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	32.3	----	20	130	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3144556)</b>											
ES1323840-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	91.7	----	70	130	----	----	
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	99.6	----	70	130	----	----	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3144979)</b>											
ES1323858-002	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	93.0	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3146002)</b>											
ES1323858-002	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	95.1	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3146002)</b>											
ES1323858-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	88.1	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3146002)</b>											
ES1323858-002	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	89.8	----	70	130	----	----	
		EP080: Toluene	108-88-3	2.5 mg/kg	87.5	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	86.6	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	89.9	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	92.2	----	70	130	----	----	
	91-20-3	EP080: Naphthalene		2.5 mg/kg	92.6	----	70	130	----	----	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3146003)</b>											
ES1323858-002	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	106	----	70	130	----	----	
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	93.6	----	70	130	----	----	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3146003)</b>											
ES1323858-002	Anonymous	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	97.3	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3146017)</b>											
ES1323859-007	MF_MW03_02	EP080: C6 - C9 Fraction	----	32.5 mg/kg	96.3	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3146017)</b>											



Sub-Matrix: SOIL

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
					MS	MSD	Low	High	Value	Control Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3146017) - continued</b>											
ES1323859-007	MF_MW03_0.2	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	90.8	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3146017)</b>											
ES1323859-007	MF_MW03_0.2	EP080: Benzene	71-43-2	2.5 mg/kg	80.4	----	70	130	----	----	
		EP080: Toluene	108-88-3	2.5 mg/kg	94.8	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	87.0	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	84.3	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	86.9	----	70	130	----	----	
		EP080: Naphthalene	91-20-3	2.5 mg/kg	82.0	----	70	130	----	----	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3151888)</b>											
ES1323840-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	89.9	----	70	130	----	----	
		EG005T: Cadmium	7440-43-9	50 mg/kg	102	----	70	130	----	----	
		EG005T: Chromium	7440-47-3	50 mg/kg	76.3	----	70	130	----	----	
		EG005T: Copper	7440-50-8	125 mg/kg	96.0	----	70	130	----	----	
		EG005T: Lead	7439-92-1	125 mg/kg	102	----	70	130	----	----	
		EG005T: Nickel	7440-02-0	50 mg/kg	99.7	----	70	130	----	----	
		EG005T: Selenium	7782-49-2	50 mg/kg	94.0	----	70	130	----	----	
		EG005T: Zinc	7440-66-6	125 mg/kg	102	----	70	130	----	----	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3151889)</b>											
ES1323840-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	96.4	----	70	130	----	----	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3151890)</b>											
ES1323859-008	MF_MW02_0.1	EG005T: Arsenic	7440-38-2	50 mg/kg	106	----	70	130	----	----	
		EG005T: Cadmium	7440-43-9	50 mg/kg	98.4	----	70	130	----	----	
		EG005T: Chromium	7440-47-3	50 mg/kg	98.8	----	70	130	----	----	
		EG005T: Copper	7440-50-8	125 mg/kg	101	----	70	130	----	----	
		EG005T: Lead	7439-92-1	125 mg/kg	97.8	----	70	130	----	----	
		EG005T: Nickel	7440-02-0	50 mg/kg	70.4	----	70	130	----	----	
		EG005T: Selenium	7782-49-2	50 mg/kg	103	----	70	130	----	----	
		EG005T: Zinc	7440-66-6	125 mg/kg	73.9	----	70	130	----	----	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3151891)</b>											
ES1323859-008	MF_MW02_0.1	EG035T: Mercury	7439-97-6	5 mg/kg	96.8	----	70	130	----	----	

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1323859</b>	Page	: 1 of 11
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: PROJECT SYMPHONY - MP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 05-NOV-2013
C-O-C number	: ----	Issue Date	: 15-NOV-2013
Sampler	: TS	No. of samples received	: 18
Order number	: 0207423	No. of samples analysed	: 12
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EA002 : pH (Soils)</b>							
<b>Soil Glass Jar - Unpreserved (EA002)</b> ML_MW03_1.7-2.0	29-OCT-2013	06-NOV-2013	05-NOV-2013	*	06-NOV-2013	06-NOV-2013	✓
<b>EA055: Moisture Content</b>							
<b>Soil Glass Jar - Unpreserved (EA055-103)</b> ML_MW10_1.6, ML_MW03_1.7	29-OCT-2013	----	----	----	11-NOV-2013	12-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EA055-103)</b> MF_MW03_0.2, MF_MW02_0.1, MF_MW01_0.2, MF_MW04_0.2, D01_301013_TS, MF_MW05_0.2, MI_SB05_0.2, MI_SB02_0.2	30-OCT-2013	----	----	----	11-NOV-2013	13-NOV-2013	✓
<b>EA150: Particle Sizing</b>							
<b>Snap Lock Bag (EA150H)</b> ML_MW03_1.7-2.0	29-OCT-2013	---	27-APR-2014	----	13-NOV-2013	27-APR-2014	✓
<b>EA150: Soil Classification based on Particle Size</b>							
<b>Snap Lock Bag (EA150H)</b> ML_MW03_1.7-2.0	29-OCT-2013	---	27-APR-2014	----	13-NOV-2013	27-APR-2014	✓
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>							
<b>Snap Lock Bag (EA200)</b> MF_MW03_0.2, MF_MW02_0.1, MF_MW01_0.2, MF_MW04_0.2, MF_MW05_0.2, MB_MW02_0.5, MI_SB05_0.2, MI_SB02_0.2	30-OCT-2013	---	28-APR-2014	----	15-NOV-2013	14-MAY-2014	✓
<b>ED008: Exchangeable Cations</b>							
<b>Soil Glass Jar - Unpreserved (ED008)</b> ML_MW03_1.7-2.0	29-OCT-2013	12-NOV-2013	26-NOV-2013	✓	12-NOV-2013	26-NOV-2013	✓





Matrix: SOIL

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EG005T: Total Metals by ICP-AES</b>							
Soil Glass Jar - Unpreserved (EG005T) ML_MW10_1.6, ML_MW03_1.7	29-OCT-2013	11-NOV-2013	27-APR-2014	✔	12-NOV-2013	27-APR-2014	✔
Soil Glass Jar - Unpreserved (EG005T) MF_MW03_0.2, MF_MW02_0.1, MF_MW01_0.2, MF_MW04_0.2, D01_301013_TS, MF_MW05_0.2, MI_SB05_0.2, MI_SB02_0.2	30-OCT-2013	11-NOV-2013	28-APR-2014	✔	12-NOV-2013	28-APR-2014	✔
<b>EG035T: Total Recoverable Mercury by FIMS</b>							
Soil Glass Jar - Unpreserved (EG035T) ML_MW10_1.6, ML_MW03_1.7	29-OCT-2013	11-NOV-2013	26-NOV-2013	✔	12-NOV-2013	26-NOV-2013	✔
Soil Glass Jar - Unpreserved (EG035T) MF_MW03_0.2, MF_MW02_0.1, MF_MW01_0.2, MF_MW04_0.2, D01_301013_TS, MF_MW05_0.2, MI_SB05_0.2, MI_SB02_0.2	30-OCT-2013	11-NOV-2013	27-NOV-2013	✔	12-NOV-2013	27-NOV-2013	✔
<b>EP004: Organic Matter</b>							
Soil Glass Jar - Unpreserved (EP004) ML_MW03_1.7-2.0	29-OCT-2013	08-NOV-2013	26-NOV-2013	✔	08-NOV-2013	26-NOV-2013	✔
<b>EP066: Polychlorinated Biphenyls (PCB)</b>							
Soil Glass Jar - Unpreserved (EP066) ML_MW10_1.6, ML_MW03_1.7	29-OCT-2013	07-NOV-2013	12-NOV-2013	✔	08-NOV-2013	17-DEC-2013	✔
Soil Glass Jar - Unpreserved (EP066) MI_SB05_0.2, MI_SB02_0.2	30-OCT-2013	07-NOV-2013	13-NOV-2013	✔	08-NOV-2013	17-DEC-2013	✔
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft</b>							
Soil Glass Jar - Unpreserved (EP071) ML_MW10_1.6, ML_MW03_1.7	29-OCT-2013	07-NOV-2013	12-NOV-2013	✔	07-NOV-2013	17-DEC-2013	✔
Soil Glass Jar - Unpreserved (EP071) MF_MW03_0.2, MF_MW02_0.1, MF_MW01_0.2, MF_MW04_0.2, D01_301013_TS, MF_MW05_0.2, MI_SB05_0.2, MI_SB02_0.2	30-OCT-2013	07-NOV-2013	13-NOV-2013	✔	07-NOV-2013	17-DEC-2013	✔
<b>EP074D: Fumigants</b>							
Soil Glass Jar - Unpreserved (EP074) ML_MW10_1.6, ML_MW03_1.7	29-OCT-2013	07-NOV-2013	05-NOV-2013	✖	07-NOV-2013	05-NOV-2013	✖
Soil Glass Jar - Unpreserved (EP074) MI_SB05_0.2, MI_SB02_0.2	30-OCT-2013	07-NOV-2013	06-NOV-2013	✖	07-NOV-2013	06-NOV-2013	✖
<b>EP074E: Halogenated Aliphatic Compounds</b>							
Soil Glass Jar - Unpreserved (EP074) ML_MW10_1.6, ML_MW03_1.7	29-OCT-2013	07-NOV-2013	05-NOV-2013	✖	07-NOV-2013	05-NOV-2013	✖
Soil Glass Jar - Unpreserved (EP074) MI_SB05_0.2, MI_SB02_0.2	30-OCT-2013	07-NOV-2013	06-NOV-2013	✖	07-NOV-2013	06-NOV-2013	✖





Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP074F: Halogenated Aromatic Compounds</b>								
Soil Glass Jar - Unpreserved (EP074) ML_MW10_1.6,	ML_MW03_1.7	29-OCT-2013	07-NOV-2013	05-NOV-2013	✖	07-NOV-2013	05-NOV-2013	✖
Soil Glass Jar - Unpreserved (EP074) MI_SB05_0.2,	MI_SB02_0.2	30-OCT-2013	07-NOV-2013	06-NOV-2013	✖	07-NOV-2013	06-NOV-2013	✖
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Soil Glass Jar - Unpreserved (EP074) ML_MW10_1.6,	ML_MW03_1.7	29-OCT-2013	07-NOV-2013	05-NOV-2013	✖	07-NOV-2013	05-NOV-2013	✖
Soil Glass Jar - Unpreserved (EP074) MI_SB05_0.2,	MI_SB02_0.2	30-OCT-2013	07-NOV-2013	06-NOV-2013	✖	07-NOV-2013	06-NOV-2013	✖
<b>EP074H: Naphthalene</b>								
Soil Glass Jar - Unpreserved (EP074) ML_MW10_1.6,	ML_MW03_1.7	29-OCT-2013	07-NOV-2013	05-NOV-2013	✖	07-NOV-2013	05-NOV-2013	✖
Soil Glass Jar - Unpreserved (EP074) MI_SB05_0.2,	MI_SB02_0.2	30-OCT-2013	07-NOV-2013	06-NOV-2013	✖	07-NOV-2013	06-NOV-2013	✖
<b>EP074B: Oxygenated Compounds</b>								
Soil Glass Jar - Unpreserved (EP074) ML_MW10_1.6,	ML_MW03_1.7	29-OCT-2013	07-NOV-2013	05-NOV-2013	✖	07-NOV-2013	05-NOV-2013	✖
Soil Glass Jar - Unpreserved (EP074) MI_SB05_0.2,	MI_SB02_0.2	30-OCT-2013	07-NOV-2013	06-NOV-2013	✖	07-NOV-2013	06-NOV-2013	✖
<b>EP074C: Sulfonated Compounds</b>								
Soil Glass Jar - Unpreserved (EP074) ML_MW10_1.6,	ML_MW03_1.7	29-OCT-2013	07-NOV-2013	05-NOV-2013	✖	07-NOV-2013	05-NOV-2013	✖
Soil Glass Jar - Unpreserved (EP074) MI_SB05_0.2,	MI_SB02_0.2	30-OCT-2013	07-NOV-2013	06-NOV-2013	✖	07-NOV-2013	06-NOV-2013	✖
<b>EP074G: Trihalomethanes</b>								
Soil Glass Jar - Unpreserved (EP074) ML_MW10_1.6,	ML_MW03_1.7	29-OCT-2013	07-NOV-2013	05-NOV-2013	✖	07-NOV-2013	05-NOV-2013	✖
Soil Glass Jar - Unpreserved (EP074) MI_SB05_0.2,	MI_SB02_0.2	30-OCT-2013	07-NOV-2013	06-NOV-2013	✖	07-NOV-2013	06-NOV-2013	✖
<b>EP075(SIM)A: Phenolic Compounds</b>								
Soil Glass Jar - Unpreserved (EP075(SIM)) ML_MW10_1.6,	ML_MW03_1.7	29-OCT-2013	07-NOV-2013	12-NOV-2013	✔	07-NOV-2013	17-DEC-2013	✔
Soil Glass Jar - Unpreserved (EP075(SIM)) MF_MW03_0.2, MF_MW01_0.2, D01_301013_TS, MI_SB05_0.2,	MF_MW02_0.1, MF_MW04_0.2, MF_MW05_0.2, MI_SB02_0.2	30-OCT-2013	07-NOV-2013	13-NOV-2013	✔	07-NOV-2013	17-DEC-2013	✔



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> ML_MW10_1.6,	ML_MW03_1.7	29-OCT-2013	07-NOV-2013	12-NOV-2013	✓	07-NOV-2013	17-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MF_MW03_0.2, MF_MW01_0.2, D01_301013_TS, MI_SB05_0.2,	MF_MW02_0.1, MF_MW04_0.2, MF_MW05_0.2, MI_SB02_0.2	30-OCT-2013	07-NOV-2013	13-NOV-2013	✓	07-NOV-2013	17-DEC-2013	✓
<b>EP080: BTEXN</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b> ML_MW10_1.6,	ML_MW03_1.7	29-OCT-2013	07-NOV-2013	12-NOV-2013	✓	07-NOV-2013	12-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MF_MW03_0.2, MF_MW01_0.2, D01_301013_TS, MI_SB05_0.2,	MF_MW02_0.1, MF_MW04_0.2, MF_MW05_0.2, MI_SB02_0.2	30-OCT-2013	07-NOV-2013	13-NOV-2013	✓	07-NOV-2013	13-NOV-2013	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b> ML_MW10_1.6,	ML_MW03_1.7	29-OCT-2013	07-NOV-2013	12-NOV-2013	✓	07-NOV-2013	12-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MF_MW03_0.2, MF_MW01_0.2, D01_301013_TS, MI_SB05_0.2,	MF_MW02_0.1, MF_MW04_0.2, MF_MW05_0.2, MI_SB02_0.2	30-OCT-2013	07-NOV-2013	13-NOV-2013	✓	07-NOV-2013	13-NOV-2013	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Exchangeable Cations with pre-treatment	ED008	1	3	33.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Moisture Content	EA055-103	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organic Matter	EP004	1	6	16.7	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	13	15.4	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
pH (1:5)	EA002	1	4	25.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	2	12	16.7	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	3	28	10.7	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	4	36	11.1	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	4	40	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
Exchangeable Cations with pre-treatment	ED008	1	3	33.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organic Matter	EP004	1	6	16.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	13	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	28	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	36	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
Exchangeable Cations with pre-treatment	ED008	1	3	33.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organic Matter	EP004	1	6	16.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	13	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	28	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	36	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
Organic Matter	EP004	1	6	16.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	13	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	28	7.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



Matrix: **SOIL** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
<i>Analytical Methods</i>							
<b>Matrix Spikes (MS) - Continued</b>							
Total Metals by ICP-AES	EG005T	2	36	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH (1:5)	EA002	SOIL	(APHA 21st ed., 4500H+) pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM (2013) Schedule B(3) (Method 103)
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Particle Size Analysis by Hydrometer	EA150H	SOIL	Particle Size Analysis by Hydrometer according to AS1289.3.6.3 - 2003
Asbestos Identification in bulk solids	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples
Exchangeable Cations with pre-treatment	ED008	SOIL	Rayment & Higginson (1992) Method 15A2. Soluble salts are removed from the sample prior to analysis. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. This method is compliant with NEPM (2013) Schedule B(3) (Method 301)
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Organic Matter	EP004	SOIL	AS1289.4.1.1 - 1997., Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM (2013) Schedule B(3) (Method 105)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (2013) Schedule B(3) (Method 506.1)
Volatile Organic Compounds	EP074	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
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Preparation Methods	Method	Matrix	Method Descriptions
Exchangeable Cations Preparation Method	ED007PR	SOIL	Rayment & Higginson (1992) method 15A1. A 1M NH <sub>4</sub> Cl extraction by end over end tumbling at a ratio of 1:20. There is no pretreatment for soluble salts. Extracts can be run by ICP for cations.
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of distilled water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Organic Matter	EP004-PR	SOIL	AS1289.4.1.1 - 1997., Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM (2013) Schedule B(3) (Method 105)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option A - Concentrating)	ORG17A	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.



## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.
- For all matrices, no Matrix Spike outliers occur.

#### Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

Matrix: SOIL

Method	Extraction / Preparation			Analysis			
	Container / Client Sample ID(s)	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
<b>EA002 : pH (Soils)</b>							
Soil Glass Jar - Unpreserved ML_MW03_1.7-2.0		06-NOV-2013	05-NOV-2013	1	----	----	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>							
Soil Glass Jar - Unpreserved ML_MW10_1.6, ML_MW03_1.7		07-NOV-2013	05-NOV-2013	2	07-NOV-2013	05-NOV-2013	2
Soil Glass Jar - Unpreserved MI_SB05_0.2, MI_SB02_0.2		07-NOV-2013	06-NOV-2013	1	07-NOV-2013	06-NOV-2013	1
<b>EP074B: Oxygenated Compounds</b>							
Soil Glass Jar - Unpreserved ML_MW10_1.6, ML_MW03_1.7		07-NOV-2013	05-NOV-2013	2	07-NOV-2013	05-NOV-2013	2
Soil Glass Jar - Unpreserved MI_SB05_0.2, MI_SB02_0.2		07-NOV-2013	06-NOV-2013	1	07-NOV-2013	06-NOV-2013	1
<b>EP074C: Sulfonated Compounds</b>							
Soil Glass Jar - Unpreserved ML_MW10_1.6, ML_MW03_1.7		07-NOV-2013	05-NOV-2013	2	07-NOV-2013	05-NOV-2013	2
Soil Glass Jar - Unpreserved MI_SB05_0.2, MI_SB02_0.2		07-NOV-2013	06-NOV-2013	1	07-NOV-2013	06-NOV-2013	1
<b>EP074D: Fumigants</b>							
Soil Glass Jar - Unpreserved ML_MW10_1.6, ML_MW03_1.7		07-NOV-2013	05-NOV-2013	2	07-NOV-2013	05-NOV-2013	2



Matrix: **SOIL**

Method Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
<b>EP074D: Fumigants - Analysis Holding Time Compliance</b>						
Soil Glass Jar - Unpreserved MI_SB05_0.2, MI_SB02_0.2	07-NOV-2013	06-NOV-2013	1	07-NOV-2013	06-NOV-2013	1
<b>EP074E: Halogenated Aliphatic Compounds</b>						
Soil Glass Jar - Unpreserved ML_MW10_1.6, ML_MW03_1.7	07-NOV-2013	05-NOV-2013	2	07-NOV-2013	05-NOV-2013	2
Soil Glass Jar - Unpreserved MI_SB05_0.2, MI_SB02_0.2	07-NOV-2013	06-NOV-2013	1	07-NOV-2013	06-NOV-2013	1
<b>EP074F: Halogenated Aromatic Compounds</b>						
Soil Glass Jar - Unpreserved ML_MW10_1.6, ML_MW03_1.7	07-NOV-2013	05-NOV-2013	2	07-NOV-2013	05-NOV-2013	2
Soil Glass Jar - Unpreserved MI_SB05_0.2, MI_SB02_0.2	07-NOV-2013	06-NOV-2013	1	07-NOV-2013	06-NOV-2013	1
<b>EP074G: Trihalomethanes</b>						
Soil Glass Jar - Unpreserved ML_MW10_1.6, ML_MW03_1.7	07-NOV-2013	05-NOV-2013	2	07-NOV-2013	05-NOV-2013	2
Soil Glass Jar - Unpreserved MI_SB05_0.2, MI_SB02_0.2	07-NOV-2013	06-NOV-2013	1	07-NOV-2013	06-NOV-2013	1
<b>EP074H: Naphthalene</b>						
Soil Glass Jar - Unpreserved ML_MW10_1.6, ML_MW03_1.7	07-NOV-2013	05-NOV-2013	2	07-NOV-2013	05-NOV-2013	2
Soil Glass Jar - Unpreserved MI_SB05_0.2, MI_SB02_0.2	07-NOV-2013	06-NOV-2013	1	07-NOV-2013	06-NOV-2013	1

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.



## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

<b>Work Order</b>	<b>: ES1323859</b>		
<b>Client</b>	<b>: ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	<b>: Environmental Division Sydney</b>
<b>Contact</b>	<b>: MR JONATHAN LEKAWSKI</b>	<b>Contact</b>	<b>: Barbara Hanna</b>
<b>Address</b>	<b>: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007</b>	<b>Address</b>	<b>: 277-289 Woodpark Road Smithfield NSW Australia 2164</b>
<b>E-mail</b>	<b>: jonathan.lekawski@erm.com</b>	<b>E-mail</b>	<b>: Barbara.Hanna@alsglobal.com</b>
<b>Telephone</b>	<b>: +61 02 8584 8888</b>	<b>Telephone</b>	<b>: +61 2 8784 8555</b>
<b>Facsimile</b>	<b>: +61 02 8584 8800</b>	<b>Facsimile</b>	<b>: +61 2 8784 8555</b>
<b>Project</b>	<b>: PROJECT SYMPHONY - MP</b>	<b>Page</b>	<b>: 1 of 3</b>
<b>Order number</b>	<b>: 0207423</b>	<b>Quote number</b>	<b>: ES2013ENVRES0370 (SY/278/13 V3)</b>
<b>C-O-C number</b>	<b>: ----</b>	<b>QC Level</b>	<b>: NEPM 2013 Schedule B(3) and ALS QCS3 requirement</b>
<b>Site</b>	<b>: ----</b>		
<b>Sampler</b>	<b>: TS</b>		

#### Dates

<b>Date Samples Received</b>	<b>: 05-NOV-2013</b>	<b>Issue Date</b>	<b>: 06-NOV-2013 13:51</b>
<b>Client Requested Due Date</b>	<b>: 14-NOV-2013</b>	<b>Scheduled Reporting Date</b>	<b>: 14-NOV-2013</b>

#### Delivery Details

<b>Mode of Delivery</b>	<b>: Carrier</b>	<b>Temperature</b>	<b>: 5.0' C - Ice present</b>
<b>No. of coolers/boxes</b>	<b>: 7</b>	<b>No. of samples received</b>	<b>: 18</b>
<b>Security Seal</b>	<b>: Intact.</b>	<b>No. of samples analysed</b>	<b>: 12</b>

#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Asbestos and PSD analysis will be conducted by ALS Newcastle.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Sample ML\_MW10\_1.5 not received by ALS Sydney.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



### Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- No sample container / preservation non-compliance exist.

### Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL	No analysis requested	SOIL - EA002 pH (1:5)	SOIL - EA150H Particle Sizing by Hydrometer	SOIL - EA200 Asbestos Identification in Soils	SOIL - ED008 Def Exchangeable Cations with	SOIL - EG005T (solids)	Total Metals by ICP-AES	SOIL - EP004 (Carbon)	Total Organic Carbon (Calc.)	SOIL - EP066 (solids)	Polychlorinated Biphenyls by GC/MS
ES1323859-002	29-OCT-2013 15:00	ML_MW10_1.6												✓
ES1323859-003	29-OCT-2013 15:00	ML_MW10_2.0	✓											
ES1323859-004	29-OCT-2013 15:00	ML_MW10_3.0	✓											
ES1323859-005	29-OCT-2013 15:00	ML_MW03_1.7												✓
ES1323859-006	29-OCT-2013 15:00	ML_MW03_1.7-2.0		✓	✓			✓			✓			
ES1323859-007	30-OCT-2013 15:00	MF_MW03_0.2					✓							
ES1323859-008	30-OCT-2013 15:00	MF_MW02_0.1					✓		✓					
ES1323859-009	30-OCT-2013 15:00	MF_MW01_0.2					✓		✓					
ES1323859-010	30-OCT-2013 15:00	MF_MW04_0.2					✓		✓					
ES1323859-011	30-OCT-2013 15:00	D01_301013_TS							✓					
ES1323859-012	30-OCT-2013 15:00	MF_MW05_0.2					✓		✓					
ES1323859-013	30-OCT-2013 15:00	MB_MW02_0.5					✓							
ES1323859-014	30-OCT-2013 15:00	D02_301013_TS	✓											
ES1323859-015	30-OCT-2013 15:00	T01_301013_TS	✓											
ES1323859-016	30-OCT-2013 15:00	MI_SB05_0.2					✓							✓
ES1323859-017	30-OCT-2013 15:00	MI_SB05_0.5	✓											
ES1323859-018	30-OCT-2013 15:00	MI_SB02_0.2					✓							✓
ES1323859-019	30-OCT-2013 15:00	MI_SB02_0.5	✓											

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EP074 (solids)	SOIL - S-27	SOIL - S-27	TRH/BTEXN/PAH/Phenols/8Metals
ES1323859-002	29-OCT-2013 15:00	ML_MW10_1.6	✓	✓	✓	✓
ES1323859-005	29-OCT-2013 15:00	ML_MW03_1.7	✓	✓	✓	✓
ES1323859-007	30-OCT-2013 15:00	MF_MW03_0.2				✓
ES1323859-008	30-OCT-2013 15:00	MF_MW02_0.1				✓
ES1323859-009	30-OCT-2013 15:00	MF_MW01_0.2				✓
ES1323859-010	30-OCT-2013 15:00	MF_MW04_0.2				✓



			SOIL - EP074 (solids)	SOIL - S-27
			Volatile Organic Compounds	TRH/BTEXN/PAH/Phenols/8Metals
ES1323859-011	30-OCT-2013 15:00	D01_301013_TS		✓
ES1323859-012	30-OCT-2013 15:00	MF_MW05_0.2		✓
ES1323859-016	30-OCT-2013 15:00	MI_SB05_0.2	✓	✓
ES1323859-018	30-OCT-2013 15:00	MI_SB02_0.2	✓	✓

### Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

### Requested Deliverables

#### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

#### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Attachment - Report ( SUBCO )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com

#### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Attachment - Report ( SUBCO )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com

#### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

DATE/ TIME: 21 Burma Road, Georgia, SA 5005  
 Ph: 08 8560 9800 E: info@als.com.au  
 QUEENSLAND: 22 Strand Street, Stirling QLD 4053  
 Ph: 07 5543 1722 E: samp@queensland.als.com.au  
 DIGIADSTONE: 46 Callomon Drive, Clinton QLD 4850  
 Ph: 07 741 5500 E: digi@adstone.als.com.au

DUMACKAY: 78 Harbour Road, Mackay QLD 4740  
 Ph: 07 4564 0177 E: mackay@als.com.au  
 DUNEDIN: 2, 4 Westall Road, Springfield VIC 3171  
 Ph: 03 8548 9800 E: samp@united.als.com.au  
 DUNEDIN: 27 Sydney Road, Mudgee NSW 2850  
 Ph: 02 6972 5735 E: mudgee@united.als.com.au

DUNEDIN: 5 Rose Gully Road, Waverley  
 Ph: 02 9600 8133 E: samp@united.als.com.au  
 DUNEDIN: 4113 Gony Place, North Hove VIC  
 Ph: 02 2423 2005 E: north@united.als.com.au  
 DUNEDIN: 10 Hood Way, Malaga WA 6000  
 Ph: 08 9205 7655 E: samp@united.als.com.au

**Environmental Division**  
**Sydney**  
**Work Order**  
**ES1323859**



Telephone : +61-2-8764 8555

Initials:  
 Date:  
 Time:  
 Signature:

**CLIENT:** ERM  
**OFFICE:** Sydney  
**PROJECT:** Project Symphony - MP  
**ORDER NUMBER:** 0207423  
**PROJECT MANAGER:** Jonathan Lekawski  
**SAMPLER:** Thavone Shay Gavin Powell  
**COC emailed to ALS?** (YES) (NO)  YES  NO  
**EDD FORMAT (or default):** pdiccawesdat  
**EMAIL Reports to (will default to PM if no other addresses are listed):** Symphony.DeltaWest@erm.com  
**EMAIL Invoice to (will default to PM if no other addresses are listed):** Symphony.DeltaWest@erm.com  
**COMMENT/SPECIAL HANDLING/STORAGE OR DISPOSAL:**

**TURNAROUND REQUIREMENTS:**  
 Standard TAT (List due date):  
 Non Standard or urgent TAT (List due date):  
 (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)  
**ALS QUOTE NO.:** SY2728/13

**CONTACT PH:**  
**SAMPLER MOBILE:** 0435 960 035  
**RELINQUISHED BY:** Thavone Shay  
**DATE/TIME:** 31-10-13/17:15

**RECEIVED BY:** Steven  
**DATE/TIME:** 5/11/13 9:00

**COC SEQUENCE NUMBER (Circle):**  
 COC: 1 2 3 4 5 6  
 OF: 1 2 3 4 5 6

**DATE/TIME:**  
**DATE/TIME:**

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (codes below)	TOTAL CONTAINERS	ANALYSIS REQUIRED INCLUDING SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)										Additional Information
						S-27 (8 metals- As, Cd, Cr, Cu, Ni, Pb, Zn, Hg, TRH/BTEX, PAH/Phenols)	Additional Metal - Se	TRH / BTEX / PAH / Phenol	Asbestos	VOC Scan	PCB	Particle Sizing (hydrometer), TOC -	pH, Exchangeable Cations plus ECEC			
1	ML-MW10-1.5	29-10-13	Soil	1x bag (B)	1	X	X	X	X	X	X	X	X	X	X	HOLD
2	ML-MW10-1.6			1x bag per / ice	1	X	X	X	X	X	X	X	X	X	X	HOLD
3	ML-MW10-2.0			"	1	X	X	X	X	X	X	X	X	X	X	HOLD
4	ML-MW10-3.0			"	1	X	X	X	X	X	X	X	X	X	X	HOLD
5	ML-MW03-1.7			1x glass jar / ice.	1	X	X	X	X	X	X	X	X	X	X	
6	ML-MW03-1.7-2.0			1x bag.	1	X	X	X	X	X	X	X	X	X	X	
7	MF-MW03-0.2	30-10-13	Soil	1 bag + 1 jar	2	X	X	X	X	X	X	X	X	X	X	
8	MF-MW02-0.1			"	2	X	X	X	X	X	X	X	X	X	X	
9	MF-MW01-0.2			"	2	X	X	X	X	X	X	X	X	X	X	
10	MF-MW04-0.2			"	2	X	X	X	X	X	X	X	X	X	X	
11	DDI-301013-TS			1 jar only	1	X	X	X	X	X	X	X	X	X	X	
12	MF-MW05-0.2			1 bag + 1 jar	2	X	X	X	X	X	X	X	X	X	X	
<b>TOTAL</b>					<b>17</b>											

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved Plastic; AP = Airfreight Unpreserved Plastic  
 V = VOA Vial HCl Preserved; V3 = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation bottles; SP = Sulfuric Preserved Plastic  
 Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ASS = Plastic Bag for Acid Sulphate Solids; B = Unpreserved Bag.





**CHAIN OF CUSTODY**  
ALS Laboratory  
please tick →

DADELAIDE 21 Burma Road Pootara SA 5095  
Ph: 08 8500 0000 E: [adelaide@alsglobal.com](mailto:adelaide@alsglobal.com)  
DORSET 22 Shire Street Stirling QLD 4053  
Ph: 07 3243 7222 E: [samples.stirling@alsglobal.com](mailto:samples.stirling@alsglobal.com)  
GLADSTONE 46 Collyer Street Gladstone QLD 4780  
Ph: 07 7471 5800 E: [gladstone@alsglobal.com](mailto:gladstone@alsglobal.com)

DIACKAY 79 Harbour Road Mackay QLD 4740  
Ph: 07 4944 0177 E: [mackay@alsglobal.com](mailto:mackay@alsglobal.com)  
DUNEDIN 24 Westall Road Springfield VIC 3171  
Ph: 03 8540 9500 E: [samples.mackay@alsglobal.com](mailto:samples.mackay@alsglobal.com)  
MURDOCH 27 Spring Road Murdoch NSW 2850  
Ph: 02 8372 6735 E: [murdoch@alsglobal.com](mailto:murdoch@alsglobal.com)

DUNCASTLE 5 Rose Gum Road Warrac  
Ph: 02 4988 6433 E: [samples.warrac@alsglobal.com](mailto:samples.warrac@alsglobal.com)  
DUNOWRA 4113 Gungah Place North Weyba N  
Ph: 024423 2065 E: [dunowra@alsglobal.com](mailto:dunowra@alsglobal.com)  
GIPPSBURGH 10 Hazel Way Malaga VIC 3960  
Ph: 08 5209 7055 E: [samples.gipps@alsglobal.com](mailto:samples.gipps@alsglobal.com)

**Environmental Division**  
Sydney  
Work Order  
**ES1323859**

multi-site NSW 2164  
[perth@alsglobal.com](mailto:perth@alsglobal.com)  
chiba QLD 4818  
[melb@alsglobal.com](mailto:melb@alsglobal.com)  
allegany NSW 2800  
[lbel@alsglobal.com](mailto:lbel@alsglobal.com)

CLIENT: ERM  
OFFICE: Sydney  
PROJECT: Project Symphony - MP  
ORDER NUMBER: 0207423  
PROJECT MANAGER: Jonathan Lekawski  
CONTACT PH: [blank]  
SAMPLER MOBILE: 0435 960 035  
SAMPLER: Thavone Shaw, Gavin Powell  
COC emailed to ALS? (YES/NO): (NO)  
EDD FORMAT (or default): pdf/csv/word  
Email Reports to (will default to PM if no other addresses are listed): Symphony, DeliaWes@erm.com  
Email Invoice to (will default to PM if no other addresses are listed): Symphony, DeliaWes@erm.com

TURNAROUND REQUIREMENTS:  
 Standard TAT (List due date):  
 Non Standard or urgent TAT (List due date):  
ALS QUOTE NO.: SYZ7813

RELINQUISHED BY: Thavone Shaw  
DATE/TIME: 28/10/13/17:15  
RECEIVED BY: Neven  
DATE/TIME: 5/11/13 9:00

COC SEQUENCE NUMBER (Circle):  
COC: 1 2 3 4 5 6  
OR: 1 2 3 4 5 6

Telephone: +61-2-8784 8555

Barcode: [Barcode]

Additional Information: [blank]

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (codes below)	TOTAL CONTAINERS	S-27 (6 metals - As, Cd, Cr, Cu, Ni, Pb, Zn, Hg, TRH/BTEX, PAH/Phenols)	Additional Metal - Se	TRH / BTEX / PAH / Phenol	Asbestos	VOC Scan	PCB	Particle Sizing (hydrometer), TOC -	pH, Exchangeable Cations plus ECEC	Additional Information
1	ML-MW10-1.5	29.10.13	Soil	1x bag (B)	1	X	X	X	X	X	X	X	X	HOLD
2	ML-MW10-1.6			1x glass jar / ice	1	X	X	X	X	X	X	X	X	HOLD
3	ML-MW10-2.0			"	1	X	X	X	X	X	X	X	X	HOLD
4	ML-MW10-3.0			"	1	X	X	X	X	X	X	X	X	HOLD
5	ML-MW03-1.7			1x glass jar / ice	1	X	X	X	X	X	X	X	X	
6	ML-MW03-1.7-2.0			1x bag	1	X	X	X	X	X	X	X	X	
7	MF-MW03-0.2	30.10.13	Soil	1 bag + 1 jar	2	X	X	X	X	X	X	X	X	
8	MF-MW02-0.1			"	2	X	X	X	X	X	X	X	X	
9	MF-MW01-0.2			"	2	X	X	X	X	X	X	X	X	
10	MF-MW04-0.2			"	2	X	X	X	X	X	X	X	X	
11	DD-301013-T3			1 jar only	1	X	X	X	X	X	X	X	X	
12	MF-MW05-0.2			1 bag + 1 jar	2	X	X	X	X	X	X	X	X	
TOTAL					17									

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Ca Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass; Unpreserved; AP - Airtight Unpreserved Plastic  
V = VOA Vial HCl Preserved; VS = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airtight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass  
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Soluble Solids; B = Unpreserved Bag

Subson / Forged Lab / Sign WO  
Lab / Analysis:  
Organised By / Date:  
Relinquished By / Date:  
Connote / Courier:  
WO No:  
Attach By PO / Internal Sheet:

# (1) not field  
# (18) extra field

## CERTIFICATE OF ANALYSIS

Work Order	: <b>ES1323862</b>	Page	: 1 of 40
Client	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: 0207423 SYMPHONY	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 05-NOV-2013
C-O-C number	: 11729,11730	Issue Date	: 11-NOV-2013
Sampler	: GP	No. of samples received	: 39
Site	: MT.PIPER	No. of samples analysed	: 37
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EA200 Legend**
- **EA200 'Am' Amosite (brown asbestos)**
- **EA200 'Ch' Chrysotile (white asbestos)**
- **EA200 'Cr' Crocidolite (blue asbestos)**
- **EA200 'Trace' - Asbestos fibres detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres**
- **EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.**
- **EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.**
- **EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.**
- **EP080: The TRIP SPIKE and TRIP SPIKE CONTROL have been analysed for volatile TPH and BTEX only. The TRIP SPIKE and TRIP SPIKE CONTROL were prepared in the lab using reagent grade sand spiked with petrol. The TRIP SPIKE was dispatched from the lab and the TRIP SPIKE CONTROL retained. The spike samples were extracted and analysed concurrently with samples reported in this batch.**



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Inorganics
		Sydney Organics
Peter Rennie	Asbestos Identifier	Newcastle - Asbestos





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB11_1.0	MK_SB04_0.2	MK_SB87_0.5	MK_SB87_1.0	TRIP SPIKE
				28-OCT-2013 15:00	28-OCT-2013 15:00	28-OCT-2013 15:00	28-OCT-2013 15:00	28-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-001	ES1323862-002	ES1323862-003	ES1323862-004	ES1323862-005
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	16.3	19.5	----	8.9	----
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	----	----
Asbestos Type	1332-21-4	0.1	--	-	-	-	----	----
Sample weight (dry)	----	0.01	g	211	212	164	----	----
APPROVED IDENTIFIER:	----	-	--	P.RENNIE	P.RENNIE	P.RENNIE	----	----
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	----	<5	----
Arsenic	7440-38-2	5	mg/kg	10	7	----	12	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	<1	----
Chromium	7440-47-3	2	mg/kg	9	12	----	8	----
Copper	7440-50-8	5	mg/kg	11	16	----	13	----
Lead	7439-92-1	5	mg/kg	13	18	----	23	----
Nickel	7440-02-0	2	mg/kg	17	25	----	18	----
Zinc	7440-66-6	5	mg/kg	69	111	----	99	----
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	<0.1	----
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	0.1	mg/kg	----	----	----	<0.1	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	----	----	----	<0.5	----
Isopropylbenzene	98-82-8	0.5	mg/kg	----	----	----	<0.5	----
n-Propylbenzene	103-65-1	0.5	mg/kg	----	----	----	<0.5	----
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	----	----	----	1.3	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	----	----	----	<0.5	----
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	----	----	----	1.0	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	----	----	----	<0.5	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	----	----	----	<0.5	----
n-Butylbenzene	104-51-8	0.5	mg/kg	----	----	----	<0.5	----
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	----	----	----	<5	----
2-Butanone (MEK)	78-93-3	5	mg/kg	----	----	----	<5	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	----	----	----	<5	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB11_1.0	MK_SB04_0.2	MK_SB87_0.5	MK_SB87_1.0	TRIP SPIKE
				28-OCT-2013 15:00	28-OCT-2013 15:00	28-OCT-2013 15:00	28-OCT-2013 15:00	28-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-001	ES1323862-002	ES1323862-003	ES1323862-004	ES1323862-005
<b>EP074B: Oxygenated Compounds - Continued</b>								
2-Hexanone (MBK)	591-78-6	5	mg/kg	----	----	----	<5	----
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	----	----	----	<0.5	----
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	----	----	----	<0.5	----
1,2-Dichloropropane	78-87-5	0.5	mg/kg	----	----	----	<0.5	----
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	----	----	----	<0.5	----
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	----	----	----	<0.5	----
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	----	----	----	<0.5	----
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	----	----	----	<5	----
Chloromethane	74-87-3	5	mg/kg	----	----	----	<5	----
Vinyl chloride	75-01-4	5	mg/kg	----	----	----	<5	----
Bromomethane	74-83-9	5	mg/kg	----	----	----	<5	----
Chloroethane	75-00-3	5	mg/kg	----	----	----	<5	----
Trichlorofluoromethane	75-69-4	5	mg/kg	----	----	----	<5	----
1,1-Dichloroethene	75-35-4	0.5	mg/kg	----	----	----	<0.5	----
Iodomethane	74-88-4	0.5	mg/kg	----	----	----	<0.5	----
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	----	----	----	<0.5	----
1,1-Dichloroethane	75-34-3	0.5	mg/kg	----	----	----	<0.5	----
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	----	----	----	<0.5	----
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	----	----	----	<0.5	----
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	----	----	----	<0.5	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg	----	----	----	<0.5	----
1,2-Dichloroethane	107-06-2	0.5	mg/kg	----	----	----	<0.5	----
Trichloroethene	79-01-6	0.5	mg/kg	----	----	----	<0.5	----
Dibromomethane	74-95-3	0.5	mg/kg	----	----	----	<0.5	----
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	----	----	----	<0.5	----
1,3-Dichloropropane	142-28-9	0.5	mg/kg	----	----	----	<0.5	----
Tetrachloroethene	127-18-4	0.5	mg/kg	----	----	----	<0.5	----
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	----	----	----	<0.5	----
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	----	----	----	<0.5	----
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	----	----	----	<0.5	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB11_1.0	MK_SB04_0.2	MK_SB87_0.5	MK_SB87_1.0	TRIP SPIKE
				28-OCT-2013 15:00	28-OCT-2013 15:00	28-OCT-2013 15:00	28-OCT-2013 15:00	28-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-001	ES1323862-002	ES1323862-003	ES1323862-004	ES1323862-005
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	----	----	----	<0.5	----
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	----	----	----	<0.5	----
Pentachloroethane	76-01-7	0.5	mg/kg	----	----	----	<0.5	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	----	----	----	<0.5	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg	----	----	----	<0.5	----
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	----	----	----	<0.5	----
Bromobenzene	108-86-1	0.5	mg/kg	----	----	----	<0.5	----
2-Chlorotoluene	95-49-8	0.5	mg/kg	----	----	----	<0.5	----
4-Chlorotoluene	106-43-4	0.5	mg/kg	----	----	----	<0.5	----
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	----	----	----	<0.5	----
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	----	----	----	<0.5	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	----	----	----	<0.5	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	----	----	----	<0.5	----
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	----	----	----	<0.5	----
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	----	----	----	<0.5	----
Bromodichloromethane	75-27-4	0.5	mg/kg	----	----	----	<0.5	----
Dibromochloromethane	124-48-1	0.5	mg/kg	----	----	----	<0.5	----
Bromoform	75-25-2	0.5	mg/kg	----	----	----	<0.5	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	----	<1	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	----	<2	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB11_1.0	MK_SB04_0.2	MK_SB87_0.5	MK_SB87_1.0	TRIP SPIKE
				28-OCT-2013 15:00	28-OCT-2013 15:00	28-OCT-2013 15:00	28-OCT-2013 15:00	28-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-001	ES1323862-002	ES1323862-003	ES1323862-004	ES1323862-005
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	----	1.7	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	----	0.5	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	----	2.2	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	----	0.6	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	----	1.2	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	----	13	54
C10 - C14 Fraction	----	50	mg/kg	<50	<50	----	730	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	----	460	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	----	<100	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	----	1190	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	----	55	61
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	----	54	36
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	----	860	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	----	300	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	----	<100	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	----	1160	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				MK_SB11_1.0	MK_SB04_0.2	MK_SB87_0.5	MK_SB87_1.0	TRIP SPIKE
				28-OCT-2013 15:00	28-OCT-2013 15:00	28-OCT-2013 15:00	28-OCT-2013 15:00	28-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-001	ES1323862-002	ES1323862-003	ES1323862-004	ES1323862-005
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 - Continued</b>								
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	----	860	----
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	<0.2	0.4
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	13.2
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	----	<0.5	1.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	----	0.9	7.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	----	<0.5	2.9
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	----	0.9	25.5
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	----	0.9	10.4
Naphthalene	91-20-3	1	mg/kg	<1	<1	----	1	<1
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	----	----	----	68.6	----
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	----	----	101	----
Toluene-D8	2037-26-5	0.1	%	----	----	----	106	----
4-Bromofluorobenzene	460-00-4	0.1	%	----	----	----	109	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	101	96.7	----	98.8	----
2-Chlorophenol-D4	93951-73-6	0.1	%	94.1	94.4	----	99.6	----
2,4,6-Tribromophenol	118-79-6	0.1	%	82.1	84.6	----	94.3	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	94.6	96.4	----	94.8	----
Anthracene-d10	1719-06-8	0.1	%	84.9	88.4	----	83.8	----
4-Terphenyl-d14	1718-51-0	0.1	%	86.9	91.4	----	86.8	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	107	104	----	104	99.5
Toluene-D8	2037-26-5	0.1	%	117	116	----	105	105
4-Bromofluorobenzene	460-00-4	0.1	%	119	117	----	109	98.7



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB05_0.5	D_281013_01_GP	MK_SB06_0.2	MK_SB02_0.5	ML_MW15_3.0
				28-OCT-2013 15:00	28-OCT-2013 15:00	28-OCT-2013 15:00	28-OCT-2013 15:00	28-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-006	ES1323862-007	ES1323862-008	ES1323862-009	ES1323862-010
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	20.7	23.9	13.5	12.0	20.1
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	----	No	No	----
Asbestos Type	1332-21-4	0.1	--	-	----	-	-	----
Sample weight (dry)	----	0.01	g	97.2	----	168	159	----
APPROVED IDENTIFIER:	----	-	--	P.RENNIE	----	P.RENNIE	P.RENNIE	----
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	<5	6	<5	<5	5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	17	10	5	7	14
Copper	7440-50-8	5	mg/kg	16	13	<5	11	10
Lead	7439-92-1	5	mg/kg	17	17	6	10	13
Nickel	7440-02-0	2	mg/kg	36	14	3	11	10
Zinc	7440-66-6	5	mg/kg	176	29	45	67	70
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	0.1	mg/kg	----	----	----	----	<0.1
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	----	----	----	----	<0.5
Isopropylbenzene	98-82-8	0.5	mg/kg	----	----	----	----	<0.5
n-Propylbenzene	103-65-1	0.5	mg/kg	----	----	----	----	<0.5
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	----	----	----	----	<0.5
sec-Butylbenzene	135-98-8	0.5	mg/kg	----	----	----	----	<0.5
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	----	----	----	----	<0.5
tert-Butylbenzene	98-06-6	0.5	mg/kg	----	----	----	----	<0.5
p-Isopropyltoluene	99-87-6	0.5	mg/kg	----	----	----	----	<0.5
n-Butylbenzene	104-51-8	0.5	mg/kg	----	----	----	----	<0.5
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	----	----	----	----	<5
2-Butanone (MEK)	78-93-3	5	mg/kg	----	----	----	----	<5
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	----	----	----	----	<5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				MK_SB05_0.5	D_281013_01_GP	MK_SB06_0.2	MK_SB02_0.5	ML_MW15_3.0
				28-OCT-2013 15:00	28-OCT-2013 15:00	28-OCT-2013 15:00	28-OCT-2013 15:00	28-OCT-2013 15:00
				ES1323862-006	ES1323862-007	ES1323862-008	ES1323862-009	ES1323862-010
Compound	CAS Number	LOR	Unit					
<b>EP074B: Oxygenated Compounds - Continued</b>								
2-Hexanone (MBK)	591-78-6	5	mg/kg	----	----	----	----	<5
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	----	----	----	----	<0.5
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	----	----	----	----	<0.5
1,2-Dichloropropane	78-87-5	0.5	mg/kg	----	----	----	----	<0.5
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	----	----	----	----	<0.5
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	----	----	----	----	<0.5
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	----	----	----	----	<0.5
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	----	----	----	----	<5
Chloromethane	74-87-3	5	mg/kg	----	----	----	----	<5
Vinyl chloride	75-01-4	5	mg/kg	----	----	----	----	<5
Bromomethane	74-83-9	5	mg/kg	----	----	----	----	<5
Chloroethane	75-00-3	5	mg/kg	----	----	----	----	<5
Trichlorofluoromethane	75-69-4	5	mg/kg	----	----	----	----	<5
1,1-Dichloroethene	75-35-4	0.5	mg/kg	----	----	----	----	<0.5
Iodomethane	74-88-4	0.5	mg/kg	----	----	----	----	<0.5
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	----	----	----	----	<0.5
1,1-Dichloroethane	75-34-3	0.5	mg/kg	----	----	----	----	<0.5
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	----	----	----	----	<0.5
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	----	----	----	----	<0.5
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	----	----	----	----	<0.5
Carbon Tetrachloride	56-23-5	0.5	mg/kg	----	----	----	----	<0.5
1,2-Dichloroethane	107-06-2	0.5	mg/kg	----	----	----	----	<0.5
Trichloroethene	79-01-6	0.5	mg/kg	----	----	----	----	<0.5
Dibromomethane	74-95-3	0.5	mg/kg	----	----	----	----	<0.5
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	----	----	----	----	<0.5
1,3-Dichloropropane	142-28-9	0.5	mg/kg	----	----	----	----	<0.5
Tetrachloroethene	127-18-4	0.5	mg/kg	----	----	----	----	<0.5
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	----	----	----	----	<0.5
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	----	----	----	----	<0.5
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	----	----	----	----	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB05_0.5	D_281013_01_GP	MK_SB06_0.2	MK_SB02_0.5	ML_MW15_3.0
				28-OCT-2013 15:00	28-OCT-2013 15:00	28-OCT-2013 15:00	28-OCT-2013 15:00	28-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-006	ES1323862-007	ES1323862-008	ES1323862-009	ES1323862-010
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	----	----	----	----	<0.5
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	----	----	----	----	<0.5
Pentachloroethane	76-01-7	0.5	mg/kg	----	----	----	----	<0.5
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	----	----	----	----	<0.5
Hexachlorobutadiene	87-68-3	0.5	mg/kg	----	----	----	----	<0.5
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	----	----	----	----	<0.5
Bromobenzene	108-86-1	0.5	mg/kg	----	----	----	----	<0.5
2-Chlorotoluene	95-49-8	0.5	mg/kg	----	----	----	----	<0.5
4-Chlorotoluene	106-43-4	0.5	mg/kg	----	----	----	----	<0.5
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	----	----	----	----	<0.5
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	----	----	----	----	<0.5
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	----	----	----	----	<0.5
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	----	----	----	----	<0.5
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	----	----	----	----	<0.5
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	----	----	----	----	<0.5
Bromodichloromethane	75-27-4	0.5	mg/kg	----	----	----	----	<0.5
Dibromochloromethane	124-48-1	0.5	mg/kg	----	----	----	----	<0.5
Bromoform	75-25-2	0.5	mg/kg	----	----	----	----	<0.5
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB05_0.5	D_281013_01_GP	MK_SB06_0.2	MK_SB02_0.5	ML_MW15_3.0
				28-OCT-2013 15:00	28-OCT-2013 15:00	28-OCT-2013 15:00	28-OCT-2013 15:00	28-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-006	ES1323862-007	ES1323862-008	ES1323862-009	ES1323862-010
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				MK_SB05_0.5	D_281013_01_GP	MK_SB06_0.2	MK_SB02_0.5	ML_MW15_3.0
				28-OCT-2013 15:00	28-OCT-2013 15:00	28-OCT-2013 15:00	28-OCT-2013 15:00	28-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-006	ES1323862-007	ES1323862-008	ES1323862-009	ES1323862-010
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 - Continued</b>								
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	----	----	----	----	67.4
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	----	----	----	90.1
Toluene-D8	2037-26-5	0.1	%	----	----	----	----	109
4-Bromofluorobenzene	460-00-4	0.1	%	----	----	----	----	92.4
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	101	96.0	100	95.0	98.7
2-Chlorophenol-D4	93951-73-6	0.1	%	92.8	95.5	102	94.7	97.3
2,4,6-Tribromophenol	118-79-6	0.1	%	83.9	86.2	79.3	76.7	78.4
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	93.4	98.4	95.9	94.9	95.4
Anthracene-d10	1719-06-8	0.1	%	83.8	88.0	85.2	83.9	86.6
4-Terphenyl-d14	1718-51-0	0.1	%	86.3	92.0	87.0	86.7	88.9
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	102	109	104	105	89.8
Toluene-D8	2037-26-5	0.1	%	114	120	113	110	91.3
4-Bromofluorobenzene	460-00-4	0.1	%	113	119	114	113	89.8



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB47_0.5	MK_SB46_1.0	MC_MW04_0.15	MK_SB82_0.2	MK_SB81_1.0
				29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-011	ES1323862-012	ES1323862-013	ES1323862-014	ES1323862-015
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	16.2	24.6	11.1	14.4	17.6
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No
Asbestos Type	1332-21-4	0.1	--	-	-	-	-	-
Sample weight (dry)	----	0.01	g	156	196	182	210	192
APPROVED IDENTIFIER:	----	-	--	P.RENNIE	P.RENNIE	P.RENNIE	P.RENNIE	P.RENNIE
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	9	12	13	5	21
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	8	9	9	12	19
Copper	7440-50-8	5	mg/kg	14	18	24	8	37
Lead	7439-92-1	5	mg/kg	27	23	24	16	28
Nickel	7440-02-0	2	mg/kg	26	80	41	19	115
Zinc	7440-66-6	5	mg/kg	55	164	157	66	159
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	0.1	mg/kg	----	----	<0.1	----	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	----	----	<0.5	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg	----	----	<0.5	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg	----	----	<0.5	----	----
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	----	----	<0.5	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	----	----	<0.5	----	----
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	----	----	<0.5	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	----	----	<0.5	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	----	----	<0.5	----	----
n-Butylbenzene	104-51-8	0.5	mg/kg	----	----	<0.5	----	----
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	----	----	<5	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg	----	----	<5	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	----	----	<5	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB47_0.5	MK_SB46_1.0	MC_MW04_0.15	MK_SB82_0.2	MK_SB81_1.0
				29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-011	ES1323862-012	ES1323862-013	ES1323862-014	ES1323862-015
<b>EP074B: Oxygenated Compounds - Continued</b>								
2-Hexanone (MBK)	591-78-6	5	mg/kg	----	----	<5	----	----
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	----	----	<0.5	----	----
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	----	----	<0.5	----	----
1,2-Dichloropropane	78-87-5	0.5	mg/kg	----	----	<0.5	----	----
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	----	----	<0.5	----	----
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	----	----	<0.5	----	----
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	----	----	<0.5	----	----
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	----	----	<5	----	----
Chloromethane	74-87-3	5	mg/kg	----	----	<5	----	----
Vinyl chloride	75-01-4	5	mg/kg	----	----	<5	----	----
Bromomethane	74-83-9	5	mg/kg	----	----	<5	----	----
Chloroethane	75-00-3	5	mg/kg	----	----	<5	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg	----	----	<5	----	----
1,1-Dichloroethene	75-35-4	0.5	mg/kg	----	----	<0.5	----	----
Iodomethane	74-88-4	0.5	mg/kg	----	----	<0.5	----	----
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	----	----	<0.5	----	----
1,1-Dichloroethane	75-34-3	0.5	mg/kg	----	----	<0.5	----	----
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	----	----	<0.5	----	----
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	----	----	<0.5	----	----
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	----	----	<0.5	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg	----	----	<0.5	----	----
1,2-Dichloroethane	107-06-2	0.5	mg/kg	----	----	<0.5	----	----
Trichloroethene	79-01-6	0.5	mg/kg	----	----	<0.5	----	----
Dibromomethane	74-95-3	0.5	mg/kg	----	----	<0.5	----	----
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	----	----	<0.5	----	----
1,3-Dichloropropane	142-28-9	0.5	mg/kg	----	----	<0.5	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg	----	----	<0.5	----	----
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	----	----	<0.5	----	----
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	----	----	<0.5	----	----
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	----	----	<0.5	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB47_0.5	MK_SB46_1.0	MC_MW04_0.15	MK_SB82_0.2	MK_SB81_1.0
				29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-011	ES1323862-012	ES1323862-013	ES1323862-014	ES1323862-015
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	----	----	<0.5	----	----
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	----	----	<0.5	----	----
Pentachloroethane	76-01-7	0.5	mg/kg	----	----	<0.5	----	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	----	----	<0.5	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg	----	----	<0.5	----	----
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	----	----	<0.5	----	----
Bromobenzene	108-86-1	0.5	mg/kg	----	----	<0.5	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg	----	----	<0.5	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg	----	----	<0.5	----	----
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	----	----	<0.5	----	----
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	----	----	<0.5	----	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	----	----	<0.5	----	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	----	----	<0.5	----	----
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	----	----	<0.5	----	----
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	----	----	<0.5	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg	----	----	<0.5	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg	----	----	<0.5	----	----
Bromoform	75-25-2	0.5	mg/kg	----	----	<0.5	----	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB47_0.5	MK_SB46_1.0	MC_MW04_0.15	MK_SB82_0.2	MK_SB81_1.0
				29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-011	ES1323862-012	ES1323862-013	ES1323862-014	ES1323862-015
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<b>0.6</b>	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<b>0.6</b>	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<b>110</b>	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<b>110</b>	<50	<50



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB47_0.5	MK_SB46_1.0	MC_MW04_0.15	MK_SB82_0.2	MK_SB81_1.0
				29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-011	ES1323862-012	ES1323862-013	ES1323862-014	ES1323862-015
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 - Continued</b>								
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	----	----	67.5	----	----
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	----	104	----	----
Toluene-D8	2037-26-5	0.1	%	----	----	125	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	----	----	106	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	99.8	99.7	99.9	88.1	89.9
2-Chlorophenol-D4	93951-73-6	0.1	%	100	101	105	87.4	99.1
2,4,6-Tribromophenol	118-79-6	0.1	%	78.2	77.0	78.2	75.3	71.4
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	93.4	94.6	96.0	89.9	94.3
Anthracene-d10	1719-06-8	0.1	%	84.8	83.2	83.9	84.9	82.6
4-Terphenyl-d14	1718-51-0	0.1	%	88.6	86.9	87.8	87.6	86.2
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	111	113	104	110	106
Toluene-D8	2037-26-5	0.1	%	118	112	105	115	116
4-Bromofluorobenzene	460-00-4	0.1	%	120	117	102	115	111



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB86_0.5	MK_SB76_0.5	MK_SB58_0.1	MK_SB76_0.2	MK_SB51_1.0
				29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00	30-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-016	ES1323862-017	ES1323862-018	ES1323862-019	ES1323862-020
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	20.7	24.6	13.2	----	17.7
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	----	No	No	No
Asbestos Type	1332-21-4	0.1	--	-	----	-	-	-
Sample weight (dry)	----	0.01	g	156	----	143	203	178
APPROVED IDENTIFIER:	----	-	--	P.RENNIE	----	P.RENNIE	P.RENNIE	P.RENNIE
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	----	<5
Arsenic	7440-38-2	5	mg/kg	19	9	8	----	8
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	----	<1
Chromium	7440-47-3	2	mg/kg	9	15	13	----	10
Copper	7440-50-8	5	mg/kg	21	19	18	----	14
Lead	7439-92-1	5	mg/kg	19	18	27	----	18
Nickel	7440-02-0	2	mg/kg	63	8	54	----	38
Zinc	7440-66-6	5	mg/kg	116	73	80	----	103
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	0.1	<0.1	<0.1	----	<0.1
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	0.1	mg/kg	----	----	----	----	<0.1
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	----	----	----	----	<0.5
Isopropylbenzene	98-82-8	0.5	mg/kg	----	----	----	----	<0.5
n-Propylbenzene	103-65-1	0.5	mg/kg	----	----	----	----	<0.5
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	----	----	----	----	<0.5
sec-Butylbenzene	135-98-8	0.5	mg/kg	----	----	----	----	<0.5
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	----	----	----	----	<0.5
tert-Butylbenzene	98-06-6	0.5	mg/kg	----	----	----	----	<0.5
p-Isopropyltoluene	99-87-6	0.5	mg/kg	----	----	----	----	<0.5
n-Butylbenzene	104-51-8	0.5	mg/kg	----	----	----	----	<0.5
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	----	----	----	----	<5
2-Butanone (MEK)	78-93-3	5	mg/kg	----	----	----	----	<5
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	----	----	----	----	<5





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB86_0.5	MK_SB76_0.5	MK_SB58_0.1	MK_SB76_0.2	MK_SB51_1.0
				29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00	30-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-016	ES1323862-017	ES1323862-018	ES1323862-019	ES1323862-020
<b>EP074B: Oxygenated Compounds - Continued</b>								
2-Hexanone (MBK)	591-78-6	5	mg/kg	----	----	----	----	<5
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	----	----	----	----	<0.5
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	----	----	----	----	<0.5
1,2-Dichloropropane	78-87-5	0.5	mg/kg	----	----	----	----	<0.5
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	----	----	----	----	<0.5
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	----	----	----	----	<0.5
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	----	----	----	----	<0.5
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	----	----	----	----	<5
Chloromethane	74-87-3	5	mg/kg	----	----	----	----	<5
Vinyl chloride	75-01-4	5	mg/kg	----	----	----	----	<5
Bromomethane	74-83-9	5	mg/kg	----	----	----	----	<5
Chloroethane	75-00-3	5	mg/kg	----	----	----	----	<5
Trichlorofluoromethane	75-69-4	5	mg/kg	----	----	----	----	<5
1,1-Dichloroethene	75-35-4	0.5	mg/kg	----	----	----	----	<0.5
Iodomethane	74-88-4	0.5	mg/kg	----	----	----	----	<0.5
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	----	----	----	----	<0.5
1,1-Dichloroethane	75-34-3	0.5	mg/kg	----	----	----	----	<0.5
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	----	----	----	----	<0.5
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	----	----	----	----	<0.5
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	----	----	----	----	<0.5
Carbon Tetrachloride	56-23-5	0.5	mg/kg	----	----	----	----	<0.5
1,2-Dichloroethane	107-06-2	0.5	mg/kg	----	----	----	----	<0.5
Trichloroethene	79-01-6	0.5	mg/kg	----	----	----	----	<0.5
Dibromomethane	74-95-3	0.5	mg/kg	----	----	----	----	<0.5
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	----	----	----	----	<0.5
1,3-Dichloropropane	142-28-9	0.5	mg/kg	----	----	----	----	<0.5
Tetrachloroethene	127-18-4	0.5	mg/kg	----	----	----	----	<0.5
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	----	----	----	----	<0.5
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	----	----	----	----	<0.5
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	----	----	----	----	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB86_0.5	MK_SB76_0.5	MK_SB58_0.1	MK_SB76_0.2	MK_SB51_1.0
				29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00	30-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-016	ES1323862-017	ES1323862-018	ES1323862-019	ES1323862-020
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	----	----	----	----	<0.5
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	----	----	----	----	<0.5
Pentachloroethane	76-01-7	0.5	mg/kg	----	----	----	----	<0.5
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	----	----	----	----	<0.5
Hexachlorobutadiene	87-68-3	0.5	mg/kg	----	----	----	----	<0.5
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	----	----	----	----	<0.5
Bromobenzene	108-86-1	0.5	mg/kg	----	----	----	----	<0.5
2-Chlorotoluene	95-49-8	0.5	mg/kg	----	----	----	----	<0.5
4-Chlorotoluene	106-43-4	0.5	mg/kg	----	----	----	----	<0.5
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	----	----	----	----	<0.5
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	----	----	----	----	<0.5
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	----	----	----	----	<0.5
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	----	----	----	----	<0.5
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	----	----	----	----	<0.5
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	----	----	----	----	<0.5
Bromodichloromethane	75-27-4	0.5	mg/kg	----	----	----	----	<0.5
Dibromochloromethane	124-48-1	0.5	mg/kg	----	----	----	----	<0.5
Bromoform	75-25-2	0.5	mg/kg	----	----	----	----	<0.5
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	----	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	----	<2



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB86_0.5	MK_SB76_0.5	MK_SB58_0.1	MK_SB76_0.2	MK_SB51_1.0
				29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00	30-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-016	ES1323862-017	ES1323862-018	ES1323862-019	ES1323862-020
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	----	<b>0.6</b>
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	----	<b>1.2</b>
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	----	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	----	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	----	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	----	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	----	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	----	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	----	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	----	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	----	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	----	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	----	<50



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB86_0.5	MK_SB76_0.5	MK_SB58_0.1	MK_SB76_0.2	MK_SB51_1.0
				29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00	29-OCT-2013 15:00	30-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-016	ES1323862-017	ES1323862-018	ES1323862-019	ES1323862-020
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 - Continued</b>								
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	----	<50
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	----	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	----	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	----	<1
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	----	----	----	----	67.1
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	----	----	----	95.4
Toluene-D8	2037-26-5	0.1	%	----	----	----	----	115
4-Bromofluorobenzene	460-00-4	0.1	%	----	----	----	----	97.6
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	101	99.8	96.7	----	104
2-Chlorophenol-D4	93951-73-6	0.1	%	102	104	104	----	105
2,4,6-Tribromophenol	118-79-6	0.1	%	79.7	80.9	74.2	----	82.6
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	101	97.0	97.7	----	98.6
Anthracene-d10	1719-06-8	0.1	%	90.6	88.6	86.4	----	87.3
4-Terphenyl-d14	1718-51-0	0.1	%	93.4	91.5	89.7	----	92.3
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	115	114	110	----	95.1
Toluene-D8	2037-26-5	0.1	%	117	113	111	----	96.4
4-Bromofluorobenzene	460-00-4	0.1	%	122	123	116	----	94.8



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MD_MW04_0.5	MD_MW04_1.2	MC_MW01_0.2	MK_SB17_1.5	MK_SB04_2.8
				30-OCT-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-021	ES1323862-022	ES1323862-023	ES1323862-024	ES1323862-025
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	----	19.2	18.1	13.5	16.9
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	----	No	----	----
Asbestos Type	1332-21-4	0.1	--	-	----	-	----	----
Sample weight (dry)	----	0.01	g	200	----	207	----	----
APPROVED IDENTIFIER:	----	-	--	P.RENNIE	----	P.RENNIE	----	----
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	----	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	----	<5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg	----	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	----	4	9	3	8
Copper	7440-50-8	5	mg/kg	----	16	14	<5	7
Lead	7439-92-1	5	mg/kg	----	20	28	6	9
Nickel	7440-02-0	2	mg/kg	----	15	18	<2	8
Zinc	7440-66-6	5	mg/kg	----	98	109	34	81
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	----	<0.1	<0.1	<0.1	<0.1
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	0.1	mg/kg	----	<0.1	----	----	<0.1
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	----	<0.5	----	----	<0.5
Isopropylbenzene	98-82-8	0.5	mg/kg	----	<0.5	----	----	<0.5
n-Propylbenzene	103-65-1	0.5	mg/kg	----	1.0	----	----	<0.5
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	----	1.8	----	----	<0.5
sec-Butylbenzene	135-98-8	0.5	mg/kg	----	1.5	----	----	<0.5
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	----	1.8	----	----	<0.5
tert-Butylbenzene	98-06-6	0.5	mg/kg	----	<0.5	----	----	<0.5
p-Isopropyltoluene	99-87-6	0.5	mg/kg	----	<0.5	----	----	<0.5
n-Butylbenzene	104-51-8	0.5	mg/kg	----	1.1	----	----	<0.5
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	----	<5	----	----	<5
2-Butanone (MEK)	78-93-3	5	mg/kg	----	<5	----	----	<5
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	----	<5	----	----	<5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MD_MW04_0.5	MD_MW04_1.2	MC_MW01_0.2	MK_SB17_1.5	MK_SB04_2.8
				30-OCT-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-021	ES1323862-022	ES1323862-023	ES1323862-024	ES1323862-025
<b>EP074B: Oxygenated Compounds - Continued</b>								
2-Hexanone (MBK)	591-78-6	5	mg/kg	----	<5	----	----	<5
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	----	<0.5	----	----	<0.5
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	----	<0.5	----	----	<0.5
1,2-Dichloropropane	78-87-5	0.5	mg/kg	----	<0.5	----	----	<0.5
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	----	<0.5	----	----	<0.5
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	----	<0.5	----	----	<0.5
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	----	<0.5	----	----	<0.5
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	----	<5	----	----	<5
Chloromethane	74-87-3	5	mg/kg	----	<5	----	----	<5
Vinyl chloride	75-01-4	5	mg/kg	----	<5	----	----	<5
Bromomethane	74-83-9	5	mg/kg	----	<5	----	----	<5
Chloroethane	75-00-3	5	mg/kg	----	<5	----	----	<5
Trichlorofluoromethane	75-69-4	5	mg/kg	----	<5	----	----	<5
1,1-Dichloroethene	75-35-4	0.5	mg/kg	----	<0.5	----	----	<0.5
Iodomethane	74-88-4	0.5	mg/kg	----	<0.5	----	----	<0.5
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	----	<0.5	----	----	<0.5
1,1-Dichloroethane	75-34-3	0.5	mg/kg	----	<0.5	----	----	<0.5
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	----	<0.5	----	----	<0.5
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	----	<0.5	----	----	<0.5
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	----	<0.5	----	----	<0.5
Carbon Tetrachloride	56-23-5	0.5	mg/kg	----	<0.5	----	----	<0.5
1,2-Dichloroethane	107-06-2	0.5	mg/kg	----	<0.5	----	----	<0.5
Trichloroethene	79-01-6	0.5	mg/kg	----	<0.5	----	----	<0.5
Dibromomethane	74-95-3	0.5	mg/kg	----	<0.5	----	----	<0.5
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	----	<0.5	----	----	<0.5
1,3-Dichloropropane	142-28-9	0.5	mg/kg	----	<0.5	----	----	<0.5
Tetrachloroethene	127-18-4	0.5	mg/kg	----	<0.5	----	----	<0.5
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	----	<0.5	----	----	<0.5
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	----	<0.5	----	----	<0.5
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	----	<0.5	----	----	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MD_MW04_0.5	MD_MW04_1.2	MC_MW01_0.2	MK_SB17_1.5	MK_SB04_2.8
				30-OCT-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-021	ES1323862-022	ES1323862-023	ES1323862-024	ES1323862-025
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	----	<0.5	----	----	<0.5
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	----	<0.5	----	----	<0.5
Pentachloroethane	76-01-7	0.5	mg/kg	----	<0.5	----	----	<0.5
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	----	<0.5	----	----	<0.5
Hexachlorobutadiene	87-68-3	0.5	mg/kg	----	<0.5	----	----	<0.5
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	----	<0.5	----	----	<0.5
Bromobenzene	108-86-1	0.5	mg/kg	----	<0.5	----	----	<0.5
2-Chlorotoluene	95-49-8	0.5	mg/kg	----	<0.5	----	----	<0.5
4-Chlorotoluene	106-43-4	0.5	mg/kg	----	<0.5	----	----	<0.5
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	----	<0.5	----	----	<0.5
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	----	<0.5	----	----	<0.5
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	----	<0.5	----	----	<0.5
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	----	<0.5	----	----	<0.5
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	----	<0.5	----	----	<0.5
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	----	<0.5	----	----	<0.5
Bromodichloromethane	75-27-4	0.5	mg/kg	----	<0.5	----	----	<0.5
Dibromochloromethane	124-48-1	0.5	mg/kg	----	<0.5	----	----	<0.5
Bromoform	75-25-2	0.5	mg/kg	----	<0.5	----	----	<0.5
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	----	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	----	<2	<2	<2	<2



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MD_MW04_0.5	MD_MW04_1.2	MC_MW01_0.2	MK_SB17_1.5	MK_SB04_2.8
				30-OCT-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-021	ES1323862-022	ES1323862-023	ES1323862-024	ES1323862-025
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	----	9.8	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	----	5.7	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	----	0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	----	16.0	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	----	0.6	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	----	1.2	1.2	1.2	1.2
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	----	26	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	----	1420	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	----	3170	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	----	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	----	4590	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	----	58	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	----	56	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	----	2490	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	----	2040	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	----	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	----	4530	<50	<50	<50





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MD_MW04_0.5	MD_MW04_1.2	MC_MW01_0.2	MK_SB17_1.5	MK_SB04_2.8
				30-OCT-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-021	ES1323862-022	ES1323862-023	ES1323862-024	ES1323862-025
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 - Continued</b>								
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	----	2480	<50	<50	<50
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	----	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	1.8	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	----	0.7	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	----	2.5	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	----	2.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	----	5	<1	<1	<1
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	----	71.4	----	----	65.4
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	104	----	----	95.6
Toluene-D8	2037-26-5	0.1	%	----	127	----	----	120
4-Bromofluorobenzene	460-00-4	0.1	%	----	109	----	----	104
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	----	99.3	90.8	94.3	99.1
2-Chlorophenol-D4	93951-73-6	0.1	%	----	97.9	99.2	93.7	95.2
2,4,6-Tribromophenol	118-79-6	0.1	%	----	77.6	66.5	78.8	82.3
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	----	87.0	94.4	94.2	90.7
Anthracene-d10	1719-06-8	0.1	%	----	81.1	83.7	84.6	79.8
4-Terphenyl-d14	1718-51-0	0.1	%	----	86.6	88.2	87.4	81.6
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	104	114	110	95.3
Toluene-D8	2037-26-5	0.1	%	----	107	111	109	101
4-Bromofluorobenzene	460-00-4	0.1	%	----	105	119	114	102



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB09_1.15	MD_MW01_2.0	MK_SB87_3.0	D_311013_01_GP	T_311013_01_GP
				30-OCT-2013 15:00	30-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-026	ES1323862-027	ES1323862-028	ES1323862-029	ES1323862-030
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	19.9	21.4	11.2	16.3	14.4
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	16	12	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	9	7	3	3	3
Copper	7440-50-8	5	mg/kg	9	21	19	27	16
Lead	7439-92-1	5	mg/kg	12	21	19	17	15
Nickel	7440-02-0	2	mg/kg	19	22	3	2	3
Zinc	7440-66-6	5	mg/kg	66	96	88	69	42
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	0.1	mg/kg	----	----	<0.1	<0.1	<0.1
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Isopropylbenzene	98-82-8	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
n-Propylbenzene	103-65-1	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
sec-Butylbenzene	135-98-8	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
tert-Butylbenzene	98-06-6	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
p-Isopropyltoluene	99-87-6	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
n-Butylbenzene	104-51-8	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	----	----	<5	<5	<5
2-Butanone (MEK)	78-93-3	5	mg/kg	----	----	<5	<5	<5
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	----	----	<5	<5	<5
2-Hexanone (MBK)	591-78-6	5	mg/kg	----	----	<5	<5	<5
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	----	----	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB09_1.15	MD_MW01_2.0	MK_SB87_3.0	D_311013_01_GP	T_311013_01_GP
				30-OCT-2013 15:00	30-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-026	ES1323862-027	ES1323862-028	ES1323862-029	ES1323862-030
<b>EP074D: Fumigants - Continued</b>								
1.2-Dichloropropane	78-87-5	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	----	----	<5	<5	<5
Chloromethane	74-87-3	5	mg/kg	----	----	<5	<5	<5
Vinyl chloride	75-01-4	5	mg/kg	----	----	<5	<5	<5
Bromomethane	74-83-9	5	mg/kg	----	----	<5	<5	<5
Chloroethane	75-00-3	5	mg/kg	----	----	<5	<5	<5
Trichlorofluoromethane	75-69-4	5	mg/kg	----	----	<5	<5	<5
1.1-Dichloroethene	75-35-4	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Iodomethane	74-88-4	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
1.1-Dichloroethane	75-34-3	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
1.1-Dichloropropylene	563-58-6	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Carbon Tetrachloride	56-23-5	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
1.2-Dichloroethane	107-06-2	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Trichloroethene	79-01-6	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Dibromomethane	74-95-3	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
1.3-Dichloropropane	142-28-9	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Tetrachloroethene	127-18-4	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Pentachloroethane	76-01-7	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Hexachlorobutadiene	87-68-3	0.5	mg/kg	----	----	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB09_1.15	MD_MW01_2.0	MK_SB87_3.0	D_311013_01_GP	T_311013_01_GP
				30-OCT-2013 15:00	30-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-026	ES1323862-027	ES1323862-028	ES1323862-029	ES1323862-030
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Bromobenzene	108-86-1	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
2-Chlorotoluene	95-49-8	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
4-Chlorotoluene	106-43-4	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Bromodichloromethane	75-27-4	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Dibromochloromethane	124-48-1	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Bromoform	75-25-2	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	0.7	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB09_1.15	MD_MW01_2.0	MK_SB87_3.0	D_311013_01_GP	T_311013_01_GP
				30-OCT-2013 15:00	30-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-026	ES1323862-027	ES1323862-028	ES1323862-029	ES1323862-030
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<b>0.5</b>	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<b>1.2</b>	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<b>120</b>	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<b>120</b>	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<b>140</b>	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<b>140</b>	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB09_1.15	MD_MW01_2.0	MK_SB87_3.0	D_311013_01_GP	T_311013_01_GP
				30-OCT-2013 15:00	30-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-026	ES1323862-027	ES1323862-028	ES1323862-029	ES1323862-030
<b>EP080: BTEXN - Continued</b>								
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	----	----	69.0	71.4	66.3
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	----	107	92.7	91.4
Toluene-D8	2037-26-5	0.1	%	----	----	118	103	94.6
4-Bromofluorobenzene	460-00-4	0.1	%	----	----	122	107	101
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	102	103	99.8	106	102
2-Chlorophenol-D4	93951-73-6	0.1	%	107	101	97.0	104	109
2,4,6-Tribromophenol	118-79-6	0.1	%	84.9	90.8	85.2	88.5	85.0
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	91.4	94.0	91.3	95.6	93.7
Anthracene-d10	1719-06-8	0.1	%	81.8	80.0	80.6	84.7	82.5
4-Terphenyl-d14	1718-51-0	0.1	%	83.0	85.9	82.6	87.7	85.4
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	111	109	110	95.2	93.4
Toluene-D8	2037-26-5	0.1	%	104	105	117	102	93.1
4-Bromofluorobenzene	460-00-4	0.1	%	111	115	124	109	105



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MC_MW04_3.0	MK_SB47_3.0	MK_SB46_2.0	MK_SB02_1.5	MK_SB51_3.0
				31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-031	ES1323862-032	ES1323862-033	ES1323862-034	ES1323862-036
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	11.4	16.0	10.2	18.3	10.2
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	9	29	<5	9	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	6	15	3	10	27
Copper	7440-50-8	5	mg/kg	12	35	20	24	<5
Lead	7439-92-1	5	mg/kg	16	36	19	27	9
Nickel	7440-02-0	2	mg/kg	19	78	4	24	7
Zinc	7440-66-6	5	mg/kg	94	148	67	46	31
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	----	----	----	<0.1
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	<0.5	----	----	----	<0.5
Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	----	----	----	<0.5
n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	----	----	----	<0.5
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	----	----	----	<0.5
sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	----	----	----	<0.5
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	----	----	----	<0.5
tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	----	----	----	<0.5
p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	----	----	----	<0.5
n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	----	----	----	<0.5
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	<5	----	----	----	<5
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	----	----	----	<5
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	----	----	----	<5
2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	----	----	----	<5
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	----	----	----	<0.5
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	----	----	----	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MC_MW04_3.0	MK_SB47_3.0	MK_SB46_2.0	MK_SB02_1.5	MK_SB51_3.0
				31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-031	ES1323862-032	ES1323862-033	ES1323862-034	ES1323862-036
<b>EP074D: Fumigants - Continued</b>								
1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	----	----	----	<0.5
cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	----	----	----	<0.5
trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	----	----	----	<0.5
1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	----	----	----	<0.5
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	----	----	----	<5
Chloromethane	74-87-3	5	mg/kg	<5	----	----	----	<5
Vinyl chloride	75-01-4	5	mg/kg	<5	----	----	----	<5
Bromomethane	74-83-9	5	mg/kg	<5	----	----	----	<5
Chloroethane	75-00-3	5	mg/kg	<5	----	----	----	<5
Trichlorofluoromethane	75-69-4	5	mg/kg	<5	----	----	----	<5
1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	----	----	----	<0.5
Iodomethane	74-88-4	0.5	mg/kg	<0.5	----	----	----	<0.5
trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	----	----	----	<0.5
1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	----	----	----	<0.5
cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	----	----	----	<0.5
1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	----	----	----	<0.5
1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	----	----	----	<0.5
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	----	----	----	<0.5
1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	----	----	----	<0.5
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	----	----	----	<0.5
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	----	----	----	<0.5
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	----	----	----	<0.5
1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	----	----	----	<0.5
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	----	----	----	<0.5
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	----	----	----	<0.5
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	----	----	----	<0.5
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	----	----	----	<0.5
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	----	----	----	<0.5
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	----	----	----	<0.5
Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	----	----	----	<0.5
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	----	----	----	<0.5
Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	----	----	----	<0.5





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MC_MW04_3.0	MK_SB47_3.0	MK_SB46_2.0	MK_SB02_1.5	MK_SB51_3.0
				31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-031	ES1323862-032	ES1323862-033	ES1323862-034	ES1323862-036
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	----	----	----	<0.5
Bromobenzene	108-86-1	0.5	mg/kg	<0.5	----	----	----	<0.5
2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	----	----	----	<0.5
4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	----	----	----	<0.5
1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	----	----	----	<0.5
1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	----	----	----	<0.5
1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	----	----	----	<0.5
1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	----	----	----	<0.5
1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	----	----	----	<0.5
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	<0.5	----	----	----	<0.5
Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	----	----	----	<0.5
Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	----	----	----	<0.5
Bromoform	75-25-2	0.5	mg/kg	<0.5	----	----	----	<0.5
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MC_MW04_3.0	MK_SB47_3.0	MK_SB46_2.0	MK_SB02_1.5	MK_SB51_3.0
				31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-031	ES1323862-032	ES1323862-033	ES1323862-034	ES1323862-036
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<b>0.5</b>	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MC_MW04_3.0	MK_SB47_3.0	MK_SB46_2.0	MK_SB02_1.5	MK_SB51_3.0
				31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00	31-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1323862-031	ES1323862-032	ES1323862-033	ES1323862-034	ES1323862-036
<b>EP080: BTEXN - Continued</b>								
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	61.5	----	----	----	62.1
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	88.8	----	----	----	93.8
Toluene-D8	2037-26-5	0.1	%	93.3	----	----	----	102
4-Bromofluorobenzene	460-00-4	0.1	%	97.5	----	----	----	104
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	100	98.6	99.6	97.6	99.0
2-Chlorophenol-D4	93951-73-6	0.1	%	97.2	104	109	108	110
2,4,6-Tribromophenol	118-79-6	0.1	%	80.4	78.2	79.0	78.2	80.5
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	89.8	88.8	92.5	90.1	93.9
Anthracene-d10	1719-06-8	0.1	%	79.4	80.1	81.9	80.8	84.3
4-Terphenyl-d14	1718-51-0	0.1	%	82.4	81.8	81.9	82.4	85.9
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	90.4	111	121	102	96.6
Toluene-D8	2037-26-5	0.1	%	92.2	112	116	108	101
4-Bromofluorobenzene	460-00-4	0.1	%	98.9	119	117	112	104



## Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)

Client sample ID

Client sampling date / time

				TRIP BLANK	TSC	---	---	---
				31-OCT-2013 15:00	31-OCT-2013 15:00	---	---	---
Compound	CAS Number	LOR	Unit	ES1323862-037	ES1323862-038	---	---	---
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
<b>C6 - C9 Fraction</b>	---	10	mg/kg	<10	<b>67</b>	---	---	---
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
<b>C6 - C10 Fraction</b>	C6_C10	10	mg/kg	<10	<b>74</b>	---	---	---
<b>C6 - C10 Fraction minus BTEX (F1)</b>	C6_C10-BTEX	10	mg/kg	<10	<b>46</b>	---	---	---
<b>EP080: BTEXN</b>								
<b>Benzene</b>	71-43-2	0.2	mg/kg	<0.2	<b>0.6</b>	---	---	---
<b>Toluene</b>	108-88-3	0.5	mg/kg	<0.5	<b>14.7</b>	---	---	---
<b>Ethylbenzene</b>	100-41-4	0.5	mg/kg	<0.5	<b>1.6</b>	---	---	---
<b>meta- &amp; para-Xylene</b>	108-38-3 106-42-3	0.5	mg/kg	<0.5	<b>8.0</b>	---	---	---
<b>ortho-Xylene</b>	95-47-6	0.5	mg/kg	<0.5	<b>3.1</b>	---	---	---
<b>Sum of BTEX</b>	---	0.2	mg/kg	<0.2	<b>28.0</b>	---	---	---
<b>Total Xylenes</b>	1330-20-7	0.5	mg/kg	<0.5	<b>11.1</b>	---	---	---
<b>Naphthalene</b>	91-20-3	1	mg/kg	<1	<b>&lt;1</b>	---	---	---
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
<b>1,2-Dichloroethane-D4</b>	17060-07-0	0.1	%	<b>85.8</b>	<b>101</b>	---	---	---
<b>Toluene-D8</b>	2037-26-5	0.1	%	<b>89.2</b>	<b>107</b>	---	---	---
<b>4-Bromofluorobenzene</b>	460-00-4	0.1	%	<b>95.4</b>	<b>106</b>	---	---	---



## Analytical Results

### Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>		
EA200: Description	MK_SB11_1.0 - 28-OCT-2013 15:00	Mid yellow - brown clay soil with grey and orange rocks plus a trace of vegetation.
EA200: Description	MK_SB04_0.2 - 28-OCT-2013 15:00	Dark brown clay soil with grey and orange rocks plus a trace of vegetation.
EA200: Description	MK_SB87_0.5 - 28-OCT-2013 15:00	Dark brown clay soil with grey and orange rocks plus a trace of vegetation.
EA200: Description	MK_SB05_0.5 - 28-OCT-2013 15:00	Dark brown clay soil with grey and orange rocks plus a trace of vegetation.
EA200: Description	MK_SB06_0.2 - 28-OCT-2013 15:00	Dark brown clay soil with grey and orange rocks plus some white quartz grains with a trace of vegetation.
EA200: Description	MK_SB02_0.5 - 28-OCT-2013 15:00	Pale brown clay soil with large grey rocks plus white quartz grains with a trace of vegetation.
EA200: Description	MK_SB47_0.5 - 29-OCT-2013 15:00	Mid brown clay soil with grey and orange rocks plus a trace of vegetation.
EA200: Description	MK_SB46_1.0 - 29-OCT-2013 15:00	Mid grey - brown clay soil with grey and orange rocks plus a trace of vegetation.
EA200: Description	MC_MW04_0.15 - 29-OCT-2013 15:00	Mid grey - brown clay soil with grey and orange rocks plus a trace of vegetation.
EA200: Description	MK_SB82_0.2 - 29-OCT-2013 15:00	Pale brown clay soil with dark grey and orange rocks plus a trace of vegetation.
EA200: Description	MK_SB81_1.0 - 29-OCT-2013 15:00	Mid grey - brown clay soil with grey rocks plus a trace of vegetation.
EA200: Description	MK_SB86_0.5 - 29-OCT-2013 15:00	Light brown clay soil with grey and orange rocks plus a trace of vegetation.
EA200: Description	MK_SB58_0.1 - 29-OCT-2013 15:00	Mid grey - brown clay soil with grey and orange rocks plus a trace of vegetation.
EA200: Description	MK_SB76_0.2 - 29-OCT-2013 15:00	Mid brown clay soil with grey and orange rocks plus some quartz grains with a trace of vegetation.
EA200: Description	MK_SB51_1.0 - 30-OCT-2013 15:00	Mid yellow - brown clay soil with grey and brown rocks plus quartz grains with a trace of vegetation.
EA200: Description	MD_MW04_0.5 - 30-OCT-2013 15:00	Mid grey - brown clay soil with grey and orange rocks plus a trace of vegetation.
EA200: Description	MC_MW01_0.2 - 30-OCT-2013 15:00	Mid grey - brown clay soil with grey and red rocks plus a trace of vegetation.



## Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP066S: PCB Surrogate</b>			
Decachlorobiphenyl	2051-24-3	39	149
<b>EP074S: VOC Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	64	130
Toluene-D8	2037-26-5	66	136
4-Bromofluorobenzene	460-00-4	60	122
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

## QUALITY CONTROL REPORT

Work Order	: <b>ES1323862</b>	Page	: 1 of 23
Client	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: 0207423 SYMPHONY	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: MT.PIPER	Date Samples Received	: 05-NOV-2013
C-O-C number	: 11729,11730	Issue Date	: 11-NOV-2013
Sampler	: GP	No. of samples received	: 39
Order number	: ----	No. of samples analysed	: 37
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :  
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
RPD = Relative Percentage Difference  
# = Indicates failed QC



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

## Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Inorganics Sydney Organics
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## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EA055: Moisture Content (QC Lot: 3146888)</b>									
ES1323862-002	MK_SB04_0.2	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	19.5	18.9	3.0	0% - 50%
ES1323862-012	MK_SB46_1.0	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	24.6	23.4	4.7	0% - 20%
<b>EA055: Moisture Content (QC Lot: 3146892)</b>									
ES1323862-023	MC_MW01_0.2	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	18.1	18.2	0.0	0% - 50%
ES1323862-034	MK_SB02_1.5	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	18.3	17.4	5.1	0% - 50%
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3144749)</b>									
ES1323610-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	20	20	0.0	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	10	9	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	7	7	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	13	15	14.9	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	12	12	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	44	44	0.0	No Limit
ES1323862-002	MK_SB04_0.2	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	12	15	21.9	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	25	24	6.5	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	7	8	21.4	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	16	17	6.2	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	18	17	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	111	98	12.3	0% - 20%
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3144751)</b>									
ES1323862-014	MK_SB82_0.2	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	12	6	70.6	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	19	6	108	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	8	<5	51.2	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	16	9	56.7	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	66	42	44.8	0% - 50%
ES1323862-026	MK_SB09_1.15	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	9	7	16.6	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	19	22	14.5	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	16	18	9.5	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	9	12	30.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3144751) - continued</b>									
ES1323862-026	MK_SB09_1.15	EG005T: Lead	7439-92-1	5	mg/kg	12	15	24.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	66	88	29.0	0% - 50%
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3144750)</b>									
ES1323610-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1323862-002	MK_SB04_0.2	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3144752)</b>									
ES1323862-014	MK_SB82_0.2	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1323862-026	MK_SB09_1.15	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 3144242)</b>									
ES1323862-004	MK_SB87_1.0	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1323862-036	MK_SB51_3.0	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3144259)</b>									
ES1323862-004	MK_SB87_1.0	EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	1.3	1.3	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	1.0	0.9	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1323862-036	MK_SB51_3.0	EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1323862-004	MK_SB87_1.0	EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.0	No Limit
ES1323862-036	MK_SB51_3.0	EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.0	No Limit
ES1323862-004	MK_SB87_1.0	EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074B: Oxygenated Compounds (QC Lot: 3144259) - continued</b>									
ES1323862-036	MK_SB51_3.0	EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.0	No Limit
<b>EP074C: Sulfonated Compounds (QC Lot: 3144259)</b>									
ES1323862-004	MK_SB87_1.0	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1323862-036	MK_SB51_3.0	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074D: Fumigants (QC Lot: 3144259)</b>									
ES1323862-004	MK_SB87_1.0	EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1323862-036	MK_SB51_3.0	EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3144259)</b>									
ES1323862-004	MK_SB87_1.0	EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3144259) - continued</b>									
ES1323862-004	MK_SB87_1.0	EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.0	No Limit
ES1323862-036	MK_SB51_3.0	EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.0	No Limit
EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.0	No Limit		
EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.0	No Limit		
EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.0	No Limit		
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.0	No Limit		
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3144259)</b>									
ES1323862-004	MK_SB87_1.0	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3144259) - continued</b>									
ES1323862-004	MK_SB87_1.0	EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1323862-036	MK_SB51_3.0	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074G: Trihalomethanes (QC Lot: 3144259)</b>									
ES1323862-004	MK_SB87_1.0	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1323862-036	MK_SB51_3.0	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3144241)</b>									
ES1323862-001	MK_SB11_1.0	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
		ES1323862-013	MC_MW04_0.15	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5
EP075(SIM): 2-Chlorophenol	95-57-8			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2-Methylphenol	95-48-7			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2-Nitrophenol	88-75-5			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2.4-Dimethylphenol	105-67-9			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2.4-Dichlorophenol	120-83-2			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2.6-Dichlorophenol	87-65-0			0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3144241) - continued</b>									
ES1323862-013	MC_MW04_0.15	EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3144510)</b>									
ES1323858-002	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
ES1323862-029	D_311013_01_GP	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3144241)</b>									
ES1323862-001	MK_SB11_1.0	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit





Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3144241) - continued</b>									
ES1323862-001	MK_SB11_1.0	EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1323862-013	MC_MW04_0.15	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3144510)</b>							
ES1323858-002	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3144510) - continued</b>									
ES1323858-002	Anonymous	EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1323862-029	D_311013_01_GP	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3144240)</b>									
ES1323862-001	MK_SB11_1.0	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1323862-013	MC_MW04_0.15	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3144257)</b>									
ES1323862-001	MK_SB11_1.0	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1323862-015	MK_SB81_1.0	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3144258)</b>									
ES1323862-004	MK_SB87_1.0	EP080: C6 - C9 Fraction	----	10	mg/kg	13	13	0.0	No Limit





Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3144258) - continued</b>										
ES1323862-036	MK_SB51_3.0	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3144509)</b>										
ES1323858-002	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit	
ES1323862-029	D_311013_01_GP	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3144240)</b>										
ES1323862-001	MK_SB11_1.0	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit	
ES1323862-013	MC_MW04_0.15	EP071: >C16 - C34 Fraction	----	100	mg/kg	110	110	0.0	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3144257)</b>										
ES1323862-001	MK_SB11_1.0	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit	
ES1323862-015	MK_SB81_1.0	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3144258)</b>										
ES1323862-004	MK_SB87_1.0	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	55	54	0.0	No Limit	
ES1323862-036	MK_SB51_3.0	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3144509)</b>										
ES1323858-002	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit	
ES1323862-029	D_311013_01_GP	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit	
<b>EP080: BTEXN (QC Lot: 3144257)</b>										
ES1323862-001	MK_SB11_1.0	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
ES1323862-015	MK_SB81_1.0	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit	
		EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	

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 Work Order : ES1323862  
 Client : ENVIRO RESOURCES MANAGEMENT  
 Project : 0207423 SYMPHONY



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP080: BTEXN (QC Lot: 3144257) - continued</b>									
ES1323862-015	MK_SB81_1.0	EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3144258)</b>									
ES1323862-004	MK_SB87_1.0	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	0.9	0.7	27.1	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	1	1	0.0	No Limit
ES1323862-036	MK_SB51_3.0	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit



### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3144749)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	111	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	105	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	130	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	112	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	107	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	116	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	94.7	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	115	81	133	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3144751)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	109	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	103	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	129	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	107	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	105	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	114	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	110	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	113	81	133	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3144750)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	81.3	66	112	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3144752)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	78.2	66	112	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3144242)</b>									
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	92.6	57.4	117	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3144259)</b>									
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	105	64	126	
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	107	66	128	
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	100	63	129	
EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	102	63	129	
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	102	64	130	
EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	102	63	129	
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	101	63	129	
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	101	62	130	
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	104	61	131	
<b>EP074B: Oxygenated Compounds (QCLot: 3144259)</b>									



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074B: Oxygenated Compounds (QCLot: 3144259) - continued</b>									
EP074: Vinyl Acetate	108-05-4	1	mg/kg	----	10 mg/kg	97.2	29.6	156	
		5	mg/kg	<5	----	----	----	----	
EP074: 2-Butanone (MEK)	78-93-3	1	mg/kg	----	10 mg/kg	97.4	58	136	
		5	mg/kg	<5	----	----	----	----	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	1	mg/kg	----	10 mg/kg	103	54	138	
		5	mg/kg	<5	----	----	----	----	
EP074: 2-Hexanone (MBK)	591-78-6	1	mg/kg	----	10 mg/kg	104	54	136	
		5	mg/kg	<5	----	----	----	----	
<b>EP074C: Sulfonated Compounds (QCLot: 3144259)</b>									
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	95.0	54	126	
<b>EP074D: Fumigants (QCLot: 3144259)</b>									
EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	100	55	133	
EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	94.8	69	127	
EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	87.6	54	124	
EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	85.2	51	125	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	101	66	126	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3144259)</b>									
EP074: Dichlorodifluoromethane	75-71-8	1	mg/kg	----	10 mg/kg	101	30	148	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloromethane	74-87-3	1	mg/kg	----	10 mg/kg	106	41	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Vinyl chloride	75-01-4	1	mg/kg	----	10 mg/kg	101	43	147	
		5	mg/kg	<5	----	----	----	----	
EP074: Bromomethane	74-83-9	1	mg/kg	----	10 mg/kg	118	47	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloroethane	75-00-3	1	mg/kg	----	10 mg/kg	104	49	143	
		5	mg/kg	<5	----	----	----	----	
EP074: Trichlorofluoromethane	75-69-4	1	mg/kg	----	10 mg/kg	105	49	135	
		5	mg/kg	<5	----	----	----	----	
EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	101	54	126	
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	93.8	43	129	
EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	101	62	130	
EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	96.7	66	132	
EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	102	66	132	
EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	98.0	62	126	
EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	96.7	64	128	
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	88.1	59	125	
EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	97.0	65	123	
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	101	64	120	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3144259) - continued</b>									
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	95.3	65	127	
EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	102	70	130	
EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	91.9	72	128	
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	106	67	143	
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	99.9	62	122	
EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	96.9	54	128	
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	113	55	129	
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	107	56	132	
EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	102	65	135	
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	87.2	19.8	134	
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	98.7	53	129	
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	106	48	136	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3144259)</b>									
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	105	70	128	
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	102	67	127	
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	103	64	130	
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	100	62	130	
EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	100	63	129	
EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	103	63	129	
EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	97.6	66	128	
EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	111	54	134	
EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	108	60	132	
<b>EP074G: Trihalomethanes (QCLot: 3144259)</b>									
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	98.7	62	120	
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	83.4	61	121	
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	101	63	121	
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	102	60	126	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3144241)</b>									
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	96.5	74	116	
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	96.4	74	116	
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	83.8	72	116	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	85.7	69	123	
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	81.4	60.3	117	
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	80.4	69	117	
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	82.4	68	112	
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	84.3	73	117	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	83.3	76.4	114	
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	74.8	57	111	
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	82.4	68.9	112	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3144241) - continued</b>									
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	33.0	3.9	57	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3144510)</b>									
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	92.8	74	116	
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	89.5	74	116	
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	84.0	72	116	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	84.9	69	123	
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	81.5	60.3	117	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	90.9	69	117	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	84.1	68	112	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	90.2	73	117	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	83.1	76.4	114	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	82.5	57	111	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	83.5	68.9	112	
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	30.1	3.9	57	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3144241)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	89.5	80	124	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	93.7	77	123	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	96.4	79	123	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	94.4	77	123	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	96.2	79	123	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	97.4	79	123	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	94.5	79	123	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	96.5	79	125	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	90.0	73	121	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	95.0	81	123	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	85.0	70	118	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	100	77	123	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	94.8	76	122	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	90.4	71	113	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	90.1	71.7	113	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	88.7	72.4	114	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3144510)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	98.6	80	124	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	84.5	77	123	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	88.6	79	123	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	87.6	77	123	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	89.9	79	123	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	90.4	79	123	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	89.0	79	123	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3144510) - continued</b>									
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	91.0	79	125	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	81.1	73	121	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	88.3	81	123	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	83.8	70	118	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	91.1	77	123	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	86.7	76	122	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	81.6	71	113	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	84.4	71.7	113	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	84.5	72.4	114	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3144240)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	106	71	131	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	109	74	138	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	116	64	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3144257)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	100	68.4	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3144258)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	90.8	68.4	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3144509)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	92.2	71	131	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	91.1	74	138	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	84.1	64	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3144240)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	112	70	130	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	110	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	
		50	mg/kg	----	150 mg/kg	114	63	131	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3144257)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	101	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3144258)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	90.3	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3144509)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	93.8	70	130	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	88.0	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	
		50	mg/kg	----	150 mg/kg	71.9	63	131	
<b>EP080: BTEXN (QCLot: 3144257)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	97.4	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	101	62	128	





Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit		Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High
<b>EP080: BTEXN (QCLot: 3144257) - continued</b>								
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	104	58	118
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	105	60	120
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	108	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	96.8	62	138
<b>EP080: BTEXN (QCLot: 3144258)</b>								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	85.7	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	98.6	62	128
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	92.7	58	118
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	94.6	60	120
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	98.3	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	98.5	62	138

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%) Low High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3144749)</b>							
ES1323610-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	105	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	103	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	104	70	130
		EG005T: Copper	7440-50-8	125 mg/kg	112	70	130
		EG005T: Lead	7439-92-1	125 mg/kg	102	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	102	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	101	70	130
		EG005T: Zinc	7440-66-6	125 mg/kg	98.9	70	130
<b>EG005T: Total Metals by ICP-AES (QCLot: 3144751)</b>							
ES1323862-014	MK_SB82_0.2	EG005T: Arsenic	7440-38-2	50 mg/kg	100	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	104	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	93.8	70	130
		EG005T: Copper	7440-50-8	125 mg/kg	105	70	130
		EG005T: Lead	7439-92-1	125 mg/kg	101	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	79.0	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	103	70	130
		EG005T: Zinc	7440-66-6	125 mg/kg	82.6	70	130





Sub-Matrix: SOIL

				Matrix Spike (MS) Report					
Laboratory sample ID		Client sample ID		Method: Compound	CAS Number	Spike Concentration	Spike Recovery(%) MS	Recovery Limits (%)	
								Low	High
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3144750)</b>									
ES1323610-001	Anonymous		EG035T: Mercury	7439-97-6	5 mg/kg	92.9		70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3144752)</b>									
ES1323862-014	MK_SB82_0.2		EG035T: Mercury	7439-97-6	5 mg/kg	93.6		70	130
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3144242)</b>									
ES1323862-004	MK_SB87_1.0		EP066: Total Polychlorinated biphenyls	----	1 mg/kg	92.2		70	130
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3144259)</b>									
ES1323862-004	MK_SB87_1.0		EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	71.5		70	130
			EP074: Trichloroethene	79-01-6	2.5 mg/kg	81.9		70	130
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3144259)</b>									
ES1323862-004	MK_SB87_1.0		EP074: Chlorobenzene	108-90-7	2.5 mg/kg	93.8		70	130
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3144241)</b>									
ES1323862-001	MK_SB11_1.0		EP075(SIM): Phenol	108-95-2	10 mg/kg	76.8		70	130
			EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	76.9		70	130
			EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	76.3		60	130
			EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	76.0		70	130
			EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	55.8		20	130
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3144510)</b>									
ES1323858-002	Anonymous		EP075(SIM): Phenol	108-95-2	10 mg/kg	93.9		70	130
			EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	90.7		70	130
			EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	79.1		60	130
			EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	76.6		70	130
			EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	51.9		20	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3144241)</b>									
ES1323862-001	MK_SB11_1.0		EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	72.1		70	130
			EP075(SIM): Pyrene	129-00-0	10 mg/kg	90.9		70	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3144510)</b>									
ES1323858-002	Anonymous		EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	86.9		70	130
			EP075(SIM): Pyrene	129-00-0	10 mg/kg	87.6		70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3144240)</b>									
ES1323862-001	MK_SB11_1.0		EP071: C10 - C14 Fraction	----	640 mg/kg	108		73	137
			EP071: C15 - C28 Fraction	----	3140 mg/kg	113		53	131
			EP071: C29 - C36 Fraction	----	2860 mg/kg	81.7		52	132
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3144257)</b>									
ES1323862-001	MK_SB11_1.0		EP080: C6 - C9 Fraction	----	32.5 mg/kg	114		70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3144258)</b>									



Sub-Matrix: SOIL

				Matrix Spike (MS) Report				
				Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3144258) - continued</b>								
ES1323862-004	MK_SB87_1.0	EP080: C6 - C9 Fraction	----	32.5 mg/kg	99.6	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3144509)</b>								
ES1323858-002	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	86.0	73	137	
		EP071: C15 - C28 Fraction	----	3140 mg/kg	82.6	53	131	
		EP071: C29 - C36 Fraction	----	2860 mg/kg	71.3	52	132	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3144240)</b>								
ES1323862-001	MK_SB11_1.0	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	116	73	137	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	92.6	53	131	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	58.1	52	132	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3144257)</b>								
ES1323862-001	MK_SB11_1.0	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	111	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3144258)</b>								
ES1323862-004	MK_SB87_1.0	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	105	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3144509)</b>								
ES1323858-002	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	104	73	137	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	75.4	53	131	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	54.2	52	132	
<b>EP080: BTEXN (QCLot: 3144257)</b>								
ES1323862-001	MK_SB11_1.0	EP080: Benzene	71-43-2	2.5 mg/kg	94.2	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	97.9	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	102	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	102	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	105	70	130	
	91-20-3	2.5 mg/kg	90.1	70	130			
<b>EP080: BTEXN (QCLot: 3144258)</b>								
ES1323862-004	MK_SB87_1.0	EP080: Benzene	71-43-2	2.5 mg/kg	86.7	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	97.1	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	91.4	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	81.1	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	98.5	70	130	
	91-20-3	2.5 mg/kg	73.6	70	130			

**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report**



The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
					MS	MSD	Low	High	Value	Control Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3144240)</b>											
ES1323862-001	MK_SB11_1.0	EP071: C10 - C14 Fraction	----	640 mg/kg	108	----	73	137	----	----	
		EP071: C15 - C28 Fraction	----	3140 mg/kg	113	----	53	131	----	----	
		EP071: C29 - C36 Fraction	----	2860 mg/kg	81.7	----	52	132	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3144240)</b>											
ES1323862-001	MK_SB11_1.0	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	116	----	73	137	----	----	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	92.6	----	53	131	----	----	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	58.1	----	52	132	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3144241)</b>											
ES1323862-001	MK_SB11_1.0	EP075(SIM): Phenol	108-95-2	10 mg/kg	76.8	----	70	130	----	----	
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	76.9	----	70	130	----	----	
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	76.3	----	60	130	----	----	
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	76.0	----	70	130	----	----	
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	55.8	----	20	130	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3144241)</b>											
ES1323862-001	MK_SB11_1.0	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	72.1	----	70	130	----	----	
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	90.9	----	70	130	----	----	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3144242)</b>											
ES1323862-004	MK_SB87_1.0	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	92.2	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3144257)</b>											
ES1323862-001	MK_SB11_1.0	EP080: C6 - C9 Fraction	----	32.5 mg/kg	114	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3144257)</b>											
ES1323862-001	MK_SB11_1.0	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	111	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3144257)</b>											
ES1323862-001	MK_SB11_1.0	EP080: Benzene	71-43-2	2.5 mg/kg	94.2	----	70	130	----	----	
		EP080: Toluene	108-88-3	2.5 mg/kg	97.9	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	102	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	102	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	105	----	70	130	----	----	
	91-20-3	2.5 mg/kg	90.1	----	70	130	----	----			
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3144258)</b>											
ES1323862-004	MK_SB87_1.0	EP080: C6 - C9 Fraction	----	32.5 mg/kg	99.6	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3144258)</b>											
ES1323862-004	MK_SB87_1.0	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	105	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3144258)</b>											



Sub-Matrix: SOIL

Laboratory sample ID					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report							
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
						MS	MSD	Low	High	Value	Control Limit	
<b>EP080: BTEXN (QCLot: 3144258) - continued</b>												
ES1323862-004	MK_SB87_1.0	EP080: Benzene	71-43-2	2.5 mg/kg	86.7	----	70	130	----	----		
		EP080: Toluene	108-88-3	2.5 mg/kg	97.1	----	70	130	----	----		
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	91.4	----	70	130	----	----		
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	81.1	----	70	130	----	----		
			106-42-3									
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	98.5	----	70	130	----	----		
		EP080: Naphthalene	91-20-3	2.5 mg/kg	73.6	----	70	130	----	----		
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3144259)</b>												
ES1323862-004	MK_SB87_1.0	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	71.5	----	70	130	----	----		
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	81.9	----	70	130	----	----		
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3144259)</b>												
ES1323862-004	MK_SB87_1.0	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	93.8	----	70	130	----	----		
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3144509)</b>												
ES1323858-002	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	86.0	----	73	137	----	----		
		EP071: C15 - C28 Fraction	----	3140 mg/kg	82.6	----	53	131	----	----		
		EP071: C29 - C36 Fraction	----	2860 mg/kg	71.3	----	52	132	----	----		
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3144509)</b>												
ES1323858-002	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	104	----	73	137	----	----		
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	75.4	----	53	131	----	----		
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	54.2	----	52	132	----	----		
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3144510)</b>												
ES1323858-002	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	93.9	----	70	130	----	----		
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	90.7	----	70	130	----	----		
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	79.1	----	60	130	----	----		
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	76.6	----	70	130	----	----		
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	51.9	----	20	130	----	----		
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3144510)</b>												
ES1323858-002	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	86.9	----	70	130	----	----		
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	87.6	----	70	130	----	----		
<b>EG005T: Total Metals by ICP-AES (QCLot: 3144749)</b>												
ES1323610-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	105	----	70	130	----	----		
		EG005T: Cadmium	7440-43-9	50 mg/kg	103	----	70	130	----	----		
		EG005T: Chromium	7440-47-3	50 mg/kg	104	----	70	130	----	----		
		EG005T: Copper	7440-50-8	125 mg/kg	112	----	70	130	----	----		
		EG005T: Lead	7439-92-1	125 mg/kg	102	----	70	130	----	----		
		EG005T: Nickel	7440-02-0	50 mg/kg	102	----	70	130	----	----		
		EG005T: Selenium	7782-49-2	50 mg/kg	101	----	70	130	----	----		
		EG005T: Zinc	7440-66-6	125 mg/kg	98.9	----	70	130	----	----		



Sub-Matrix: SOIL

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report							
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
					MS	MSD	Low	High	Value	Control Limit	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3144750)</b>											
ES1323610-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	92.9	----	70	130	----	----	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3144751)</b>											
ES1323862-014	MK_SB82_0.2	EG005T: Arsenic	7440-38-2	50 mg/kg	100	----	70	130	----	----	
		EG005T: Cadmium	7440-43-9	50 mg/kg	104	----	70	130	----	----	
		EG005T: Chromium	7440-47-3	50 mg/kg	93.8	----	70	130	----	----	
		EG005T: Copper	7440-50-8	125 mg/kg	105	----	70	130	----	----	
		EG005T: Lead	7439-92-1	125 mg/kg	101	----	70	130	----	----	
		EG005T: Nickel	7440-02-0	50 mg/kg	79.0	----	70	130	----	----	
		EG005T: Selenium	7782-49-2	50 mg/kg	103	----	70	130	----	----	
		EG005T: Zinc	7440-66-6	125 mg/kg	82.6	----	70	130	----	----	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3144752)</b>											
ES1323862-014	MK_SB82_0.2	EG035T: Mercury	7439-97-6	5 mg/kg	93.6	----	70	130	----	----	

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1323862</b>	Page	: 1 of 16
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: 0207423 SYMPHONY	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: MT.PIPER	Date Samples Received	: 05-NOV-2013
C-O-C number	: 11729,11730	Issue Date	: 11-NOV-2013
Sampler	: GP	No. of samples received	: 39
Order number	: ----	No. of samples analysed	: 37
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EA055: Moisture Content</b>								
<b>Soil Glass Jar - Unpreserved (EA055-103)</b> MK_SB11_1.0, MK_SB87_1.0, D_281013_01_GP, MK_SB02_0.5,	MK_SB04_0.2, MK_SB05_0.5, MK_SB06_0.2, ML_MW15_3.0	28-OCT-2013	----	----	----	07-NOV-2013	11-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EA055-103)</b> MK_SB47_0.5, MC_MW04_0.15, MK_SB81_1.0, MK_SB76_0.5,	MK_SB46_1.0, MK_SB82_0.2, MK_SB86_0.5, MK_SB58_0.1	29-OCT-2013	----	----	----	07-NOV-2013	12-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EA055-103)</b> MK_SB51_1.0, MC_MW01_0.2, MK_SB04_2.8, MD_MW01_2.0	MD_MW04_1.2, MK_SB17_1.5, MK_SB09_1.15,	30-OCT-2013	----	----	----	07-NOV-2013	13-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EA055-103)</b> MK_SB87_3.0, T_311013_01_GP, MK_SB47_3.0, MK_SB02_1.5,	D_311013_01_GP, MC_MW04_3.0, MK_SB46_2.0, MK_SB51_3.0	31-OCT-2013	----	----	----	07-NOV-2013	14-NOV-2013	✓
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
<b>Snap Lock Bag (EA200)</b> MK_SB11_1.0, MK_SB87_0.5, MK_SB06_0.2,	MK_SB04_0.2, MK_SB05_0.5, MK_SB02_0.5	28-OCT-2013	---	26-APR-2014	----	11-NOV-2013	10-MAY-2014	✓
<b>Snap Lock Bag (EA200)</b> MK_SB47_0.5, MC_MW04_0.15, MK_SB81_1.0, MK_SB58_0.1,	MK_SB46_1.0, MK_SB82_0.2, MK_SB86_0.5, MK_SB76_0.2	29-OCT-2013	---	27-APR-2014	----	11-NOV-2013	10-MAY-2014	✓
<b>Snap Lock Bag (EA200)</b> MK_SB51_1.0, MC_MW01_0.2	MD_MW04_0.5,	30-OCT-2013	---	28-APR-2014	----	11-NOV-2013	10-MAY-2014	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EG005T: Total Metals by ICP-AES</b>							
<b>Soil Glass Jar - Unpreserved (EG005T)</b> MK_SB11_1.0, MK_SB87_1.0, D_281013_01_GP, MK_SB02_0.5, MK_SB04_0.2, MK_SB05_0.5, MK_SB06_0.2, ML_MW15_3.0	28-OCT-2013	06-NOV-2013	26-APR-2014	✓	07-NOV-2013	26-APR-2014	✓
<b>Soil Glass Jar - Unpreserved (EG005T)</b> MK_SB47_0.5, MC_MW04_0.15, MK_SB81_1.0, MK_SB76_0.5, MK_SB46_1.0, MK_SB82_0.2, MK_SB86_0.5, MK_SB58_0.1	29-OCT-2013	06-NOV-2013	27-APR-2014	✓	07-NOV-2013	27-APR-2014	✓
<b>Soil Glass Jar - Unpreserved (EG005T)</b> MK_SB51_1.0, MC_MW01_0.2, MK_SB04_2.8, MD_MW01_2.0, MD_MW04_1.2, MK_SB17_1.5, MK_SB09_1.15	30-OCT-2013	06-NOV-2013	28-APR-2014	✓	07-NOV-2013	28-APR-2014	✓
<b>Soil Glass Jar - Unpreserved (EG005T)</b> MK_SB87_3.0, T_311013_01_GP, MK_SB47_3.0, MK_SB02_1.5, D_311013_01_GP, MC_MW04_3.0, MK_SB46_2.0, MK_SB51_3.0	31-OCT-2013	06-NOV-2013	29-APR-2014	✓	07-NOV-2013	29-APR-2014	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>							
<b>Soil Glass Jar - Unpreserved (EG035T)</b> MK_SB11_1.0, MK_SB87_1.0, D_281013_01_GP, MK_SB02_0.5, MK_SB04_0.2, MK_SB05_0.5, MK_SB06_0.2, ML_MW15_3.0	28-OCT-2013	06-NOV-2013	25-NOV-2013	✓	07-NOV-2013	25-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EG035T)</b> MK_SB47_0.5, MC_MW04_0.15, MK_SB81_1.0, MK_SB76_0.5, MK_SB46_1.0, MK_SB82_0.2, MK_SB86_0.5, MK_SB58_0.1	29-OCT-2013	06-NOV-2013	26-NOV-2013	✓	07-NOV-2013	26-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EG035T)</b> MK_SB51_1.0, MC_MW01_0.2, MK_SB04_2.8, MD_MW01_2.0, MD_MW04_1.2, MK_SB17_1.5, MK_SB09_1.15	30-OCT-2013	06-NOV-2013	27-NOV-2013	✓	07-NOV-2013	27-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EG035T)</b> MK_SB87_3.0, T_311013_01_GP, MK_SB47_3.0, MK_SB02_1.5, D_311013_01_GP, MC_MW04_3.0, MK_SB46_2.0, MK_SB51_3.0	31-OCT-2013	06-NOV-2013	28-NOV-2013	✓	07-NOV-2013	28-NOV-2013	✓





Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP066: Polychlorinated Biphenyls (PCB)</b>							
<b>Soil Glass Jar - Unpreserved (EP066)</b> MK_SB87_1.0, ML_MW15_3.0	28-OCT-2013	06-NOV-2013	11-NOV-2013	✓	07-NOV-2013	16-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP066)</b> MC_MW04_0.15	29-OCT-2013	06-NOV-2013	12-NOV-2013	✓	07-NOV-2013	16-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP066)</b> MK_SB51_1.0, MD_MW04_1.2, MK_SB04_2.8	30-OCT-2013	06-NOV-2013	13-NOV-2013	✓	07-NOV-2013	16-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP066)</b> MK_SB87_3.0, D_311013_01_GP, T_311013_01_GP, MC_MW04_3.0, MK_SB51_3.0	31-OCT-2013	06-NOV-2013	14-NOV-2013	✓	07-NOV-2013	16-DEC-2013	✓
<b>EP080/071: Total Petroleum Hydrocarbons</b>							
<b>Soil Glass Jar - Unpreserved (EP071)</b> MK_SB11_1.0, MK_SB04_0.2, MK_SB87_1.0, MK_SB05_0.5, D_281013_01_GP, MK_SB06_0.2, MK_SB02_0.5, ML_MW15_3.0	28-OCT-2013	06-NOV-2013	11-NOV-2013	✓	07-NOV-2013	16-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP071)</b> MK_SB47_0.5, MK_SB46_1.0, MC_MW04_0.15, MK_SB82_0.2, MK_SB81_1.0, MK_SB86_0.5, MK_SB76_0.5, MK_SB58_0.1	29-OCT-2013	06-NOV-2013	12-NOV-2013	✓	07-NOV-2013	16-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP071)</b> MK_SB51_1.0, MD_MW04_1.2, MC_MW01_0.2, MK_SB17_1.5, MK_SB04_2.8, MK_SB09_1.15, MD_MW01_2.0	30-OCT-2013	06-NOV-2013	13-NOV-2013	✓	07-NOV-2013	16-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP071)</b> MK_SB87_3.0, D_311013_01_GP, T_311013_01_GP, MC_MW04_3.0, MK_SB47_3.0, MK_SB46_2.0, MK_SB02_1.5, MK_SB51_3.0	31-OCT-2013	06-NOV-2013	14-NOV-2013	✓	07-NOV-2013	16-DEC-2013	✓



Matrix: SOIL

Evaluation: ✘ = Holding time breach ; ✔ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP074D: Fumigants</b>								
Soil Glass Jar - Unpreserved (EP074) MK_SB87_1.0, ML_MW15_3.0	28-OCT-2013	06-NOV-2013	04-NOV-2013	✘	07-NOV-2013	04-NOV-2013	✘	
Soil Glass Jar - Unpreserved (EP074) MC_MW04_0.15	29-OCT-2013	06-NOV-2013	05-NOV-2013	✘	07-NOV-2013	05-NOV-2013	✘	
Soil Glass Jar - Unpreserved (EP074) MK_SB51_1.0, MD_MW04_1.2, MK_SB04_2.8	30-OCT-2013	06-NOV-2013	06-NOV-2013	✔	07-NOV-2013	06-NOV-2013	✘	
Soil Glass Jar - Unpreserved (EP074) MK_SB87_3.0, D_311013_01_GP, T_311013_01_GP, MC_MW04_3.0, MK_SB51_3.0	31-OCT-2013	06-NOV-2013	07-NOV-2013	✔	07-NOV-2013	07-NOV-2013	✔	
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Soil Glass Jar - Unpreserved (EP074) MK_SB87_1.0, ML_MW15_3.0	28-OCT-2013	06-NOV-2013	04-NOV-2013	✘	07-NOV-2013	04-NOV-2013	✘	
Soil Glass Jar - Unpreserved (EP074) MC_MW04_0.15	29-OCT-2013	06-NOV-2013	05-NOV-2013	✘	07-NOV-2013	05-NOV-2013	✘	
Soil Glass Jar - Unpreserved (EP074) MK_SB51_1.0, MD_MW04_1.2, MK_SB04_2.8	30-OCT-2013	06-NOV-2013	06-NOV-2013	✔	07-NOV-2013	06-NOV-2013	✘	
Soil Glass Jar - Unpreserved (EP074) MK_SB87_3.0, D_311013_01_GP, T_311013_01_GP, MC_MW04_3.0, MK_SB51_3.0	31-OCT-2013	06-NOV-2013	07-NOV-2013	✔	07-NOV-2013	07-NOV-2013	✔	
<b>EP074F: Halogenated Aromatic Compounds</b>								
Soil Glass Jar - Unpreserved (EP074) MK_SB87_1.0, ML_MW15_3.0	28-OCT-2013	06-NOV-2013	04-NOV-2013	✘	07-NOV-2013	04-NOV-2013	✘	
Soil Glass Jar - Unpreserved (EP074) MC_MW04_0.15	29-OCT-2013	06-NOV-2013	05-NOV-2013	✘	07-NOV-2013	05-NOV-2013	✘	
Soil Glass Jar - Unpreserved (EP074) MK_SB51_1.0, MD_MW04_1.2, MK_SB04_2.8	30-OCT-2013	06-NOV-2013	06-NOV-2013	✔	07-NOV-2013	06-NOV-2013	✘	
Soil Glass Jar - Unpreserved (EP074) MK_SB87_3.0, D_311013_01_GP, T_311013_01_GP, MC_MW04_3.0, MK_SB51_3.0	31-OCT-2013	06-NOV-2013	07-NOV-2013	✔	07-NOV-2013	07-NOV-2013	✔	



Matrix: SOIL

Evaluation: ✘ = Holding time breach ; ✔ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Soil Glass Jar - Unpreserved (EP074) MK_SB87_1.0, ML_MW15_3.0	28-OCT-2013	06-NOV-2013	04-NOV-2013	✘	07-NOV-2013	04-NOV-2013	✘	
Soil Glass Jar - Unpreserved (EP074) MC_MW04_0.15	29-OCT-2013	06-NOV-2013	05-NOV-2013	✘	07-NOV-2013	05-NOV-2013	✘	
Soil Glass Jar - Unpreserved (EP074) MK_SB51_1.0, MD_MW04_1.2, MK_SB04_2.8	30-OCT-2013	06-NOV-2013	06-NOV-2013	✔	07-NOV-2013	06-NOV-2013	✘	
Soil Glass Jar - Unpreserved (EP074) MK_SB87_3.0, D_311013_01_GP, T_311013_01_GP, MC_MW04_3.0, MK_SB51_3.0	31-OCT-2013	06-NOV-2013	07-NOV-2013	✔	07-NOV-2013	07-NOV-2013	✔	
<b>EP074B: Oxygenated Compounds</b>								
Soil Glass Jar - Unpreserved (EP074) MK_SB87_1.0, ML_MW15_3.0	28-OCT-2013	06-NOV-2013	04-NOV-2013	✘	07-NOV-2013	04-NOV-2013	✘	
Soil Glass Jar - Unpreserved (EP074) MC_MW04_0.15	29-OCT-2013	06-NOV-2013	05-NOV-2013	✘	07-NOV-2013	05-NOV-2013	✘	
Soil Glass Jar - Unpreserved (EP074) MK_SB51_1.0, MD_MW04_1.2, MK_SB04_2.8	30-OCT-2013	06-NOV-2013	06-NOV-2013	✔	07-NOV-2013	06-NOV-2013	✘	
Soil Glass Jar - Unpreserved (EP074) MK_SB87_3.0, D_311013_01_GP, T_311013_01_GP, MC_MW04_3.0, MK_SB51_3.0	31-OCT-2013	06-NOV-2013	07-NOV-2013	✔	07-NOV-2013	07-NOV-2013	✔	
<b>EP074C: Sulfonated Compounds</b>								
Soil Glass Jar - Unpreserved (EP074) MK_SB87_1.0, ML_MW15_3.0	28-OCT-2013	06-NOV-2013	04-NOV-2013	✘	07-NOV-2013	04-NOV-2013	✘	
Soil Glass Jar - Unpreserved (EP074) MC_MW04_0.15	29-OCT-2013	06-NOV-2013	05-NOV-2013	✘	07-NOV-2013	05-NOV-2013	✘	
Soil Glass Jar - Unpreserved (EP074) MK_SB51_1.0, MD_MW04_1.2, MK_SB04_2.8	30-OCT-2013	06-NOV-2013	06-NOV-2013	✔	07-NOV-2013	06-NOV-2013	✘	
Soil Glass Jar - Unpreserved (EP074) MK_SB87_3.0, D_311013_01_GP, T_311013_01_GP, MC_MW04_3.0, MK_SB51_3.0	31-OCT-2013	06-NOV-2013	07-NOV-2013	✔	07-NOV-2013	07-NOV-2013	✔	



Matrix: **SOIL**

Evaluation: ✘ = Holding time breach ; ✔ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP074G: Trihalomethanes</b>							
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB87_1.0, ML_MW15_3.0	28-OCT-2013	06-NOV-2013	04-NOV-2013	✘	07-NOV-2013	04-NOV-2013	✘
<b>Soil Glass Jar - Unpreserved (EP074)</b> MC_MW04_0.15	29-OCT-2013	06-NOV-2013	05-NOV-2013	✘	07-NOV-2013	05-NOV-2013	✘
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB51_1.0, MD_MW04_1.2, MK_SB04_2.8	30-OCT-2013	06-NOV-2013	06-NOV-2013	✔	07-NOV-2013	06-NOV-2013	✘
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB87_3.0, D_311013_01_GP, T_311013_01_GP, MC_MW04_3.0, MK_SB51_3.0	31-OCT-2013	06-NOV-2013	07-NOV-2013	✔	07-NOV-2013	07-NOV-2013	✔
<b>EP075(SIM)A: Phenolic Compounds</b>							
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MK_SB11_1.0, MK_SB04_0.2, MK_SB87_1.0, MK_SB05_0.5, D_281013_01_GP, MK_SB06_0.2, MK_SB02_0.5, ML_MW15_3.0	28-OCT-2013	06-NOV-2013	11-NOV-2013	✔	07-NOV-2013	16-DEC-2013	✔
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MK_SB47_0.5, MK_SB46_1.0, MC_MW04_0.15, MK_SB82_0.2, MK_SB81_1.0, MK_SB86_0.5, MK_SB76_0.5, MK_SB58_0.1	29-OCT-2013	06-NOV-2013	12-NOV-2013	✔	07-NOV-2013	16-DEC-2013	✔
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MK_SB51_1.0, MD_MW04_1.2, MC_MW01_0.2, MK_SB17_1.5, MK_SB04_2.8, MK_SB09_1.15, MD_MW01_2.0	30-OCT-2013	06-NOV-2013	13-NOV-2013	✔	07-NOV-2013	16-DEC-2013	✔
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MK_SB87_3.0, D_311013_01_GP, T_311013_01_GP, MC_MW04_3.0, MK_SB47_3.0, MK_SB46_2.0, MK_SB02_1.5, MK_SB51_3.0	31-OCT-2013	06-NOV-2013	14-NOV-2013	✔	07-NOV-2013	16-DEC-2013	✔



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>							
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MK_SB11_1.0, MK_SB87_1.0, D_281013_01_GP, MK_SB02_0.5, MK_SB04_0.2, MK_SB05_0.5, MK_SB06_0.2, ML_MW15_3.0	28-OCT-2013	06-NOV-2013	11-NOV-2013	✓	07-NOV-2013	16-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MK_SB47_0.5, MC_MW04_0.15, MK_SB81_1.0, MK_SB76_0.5, MK_SB46_1.0, MK_SB82_0.2, MK_SB86_0.5, MK_SB58_0.1	29-OCT-2013	06-NOV-2013	12-NOV-2013	✓	07-NOV-2013	16-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MK_SB51_1.0, MC_MW01_0.2, MK_SB04_2.8, MD_MW01_2.0, MD_MW04_1.2, MK_SB17_1.5, MK_SB09_1.15,	30-OCT-2013	06-NOV-2013	13-NOV-2013	✓	07-NOV-2013	16-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MK_SB87_3.0, T_311013_01_GP, MK_SB47_3.0, MK_SB02_1.5, D_311013_01_GP, MC_MW04_3.0, MK_SB46_2.0, MK_SB51_3.0	31-OCT-2013	06-NOV-2013	14-NOV-2013	✓	07-NOV-2013	16-DEC-2013	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP080: BTEXN</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB11_1.0, TRIP SPIKE, D_281013_01_GP, MK_SB02_0.5	MK_SB04_0.2, MK_SB05_0.5, MK_SB06_0.2,	28-OCT-2013	06-NOV-2013	11-NOV-2013	✓	06-NOV-2013	11-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB87_1.0,	ML_MW15_3.0	28-OCT-2013	06-NOV-2013	11-NOV-2013	✓	07-NOV-2013	11-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB47_0.5, MK_SB82_0.2, MK_SB86_0.5, MK_SB58_0.1	MK_SB46_1.0, MK_SB81_1.0, MK_SB76_0.5,	29-OCT-2013	06-NOV-2013	12-NOV-2013	✓	06-NOV-2013	12-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MC_MW04_0.15		29-OCT-2013	06-NOV-2013	12-NOV-2013	✓	07-NOV-2013	12-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MC_MW01_0.2, MK_SB09_1.15,	MK_SB17_1.5, MD_MW01_2.0	30-OCT-2013	06-NOV-2013	13-NOV-2013	✓	06-NOV-2013	13-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB51_1.0, MK_SB04_2.8	MD_MW04_1.2,	30-OCT-2013	06-NOV-2013	13-NOV-2013	✓	07-NOV-2013	13-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB47_3.0,	MK_SB46_2.0	31-OCT-2013	06-NOV-2013	14-NOV-2013	✓	06-NOV-2013	14-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB87_3.0, T_311013_01_GP, MK_SB02_1.5, TRIP BLANK,	D_311013_01_GP, MC_MW04_3.0, MK_SB51_3.0, TSC	31-OCT-2013	06-NOV-2013	14-NOV-2013	✓	07-NOV-2013	14-NOV-2013	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB11_1.0, TRIP SPIKE, D_281013_01_GP, MK_SB02_0.5	MK_SB04_0.2, MK_SB05_0.5, MK_SB06_0.2,	28-OCT-2013	06-NOV-2013	11-NOV-2013	✓	06-NOV-2013	11-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB87_1.0,	ML_MW15_3.0	28-OCT-2013	06-NOV-2013	11-NOV-2013	✓	07-NOV-2013	11-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB47_0.5, MK_SB82_0.2, MK_SB86_0.5, MK_SB58_0.1	MK_SB46_1.0, MK_SB81_1.0, MK_SB76_0.5,	29-OCT-2013	06-NOV-2013	12-NOV-2013	✓	06-NOV-2013	12-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MC_MW04_0.15		29-OCT-2013	06-NOV-2013	12-NOV-2013	✓	07-NOV-2013	12-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MC_MW01_0.2, MK_SB09_1.15,	MK_SB17_1.5, MD_MW01_2.0	30-OCT-2013	06-NOV-2013	13-NOV-2013	✓	06-NOV-2013	13-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB51_1.0, MK_SB04_2.8	MD_MW04_1.2,	30-OCT-2013	06-NOV-2013	13-NOV-2013	✓	07-NOV-2013	13-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB47_3.0,	MK_SB46_2.0	31-OCT-2013	06-NOV-2013	14-NOV-2013	✓	06-NOV-2013	14-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB87_3.0, T_311013_01_GP, MK_SB02_1.5, TRIP BLANK,	D_311013_01_GP, MC_MW04_3.0, MK_SB51_3.0, TSC	31-OCT-2013	06-NOV-2013	14-NOV-2013	✓	07-NOV-2013	14-NOV-2013	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Moisture Content	EA055-103	4	39	10.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	4	38	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	2	11	18.2	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	4	40	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	4	40	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	4	38	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	4	37	10.8	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	11	18.2	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	2	38	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	38	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	37	5.4	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
PAH/Phenols (SIM)	EP075(SIM)	2	38	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	38	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	37	5.4	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	2	38	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	38	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	37	5.4	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement





## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Asbestos Identification in bulk solids	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (2013) Schedule B(3) (Method 506.1)
Volatile Organic Compounds	EP074	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option A - Concentrating)	ORG17A	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

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Work Order : ES1323862  
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Project : 0207423 SYMPHONY



<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.



## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.
- For all matrices, no Matrix Spike outliers occur.

#### Regular Sample Surrogates

Sub-Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Samples Submitted</b>							
EP074S: VOC Surrogates	ES1323862-028	MK_SB87_3.0	4-Bromofluorobenzene	460-00-4	122 %	60-122 %	Recovery greater than upper data quality objective

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

Matrix: **SOIL**

Method	Extraction / Preparation			Analysis			
	Container / Client Sample ID(s)	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>							
<b>Soil Glass Jar - Unpreserved</b>							
MK_SB87_1.0,	ML_MW15_3.0	06-NOV-2013	04-NOV-2013	2	07-NOV-2013	04-NOV-2013	3
<b>Soil Glass Jar - Unpreserved</b>							
MC_MW04_0.15		06-NOV-2013	05-NOV-2013	1	07-NOV-2013	05-NOV-2013	2
<b>Soil Glass Jar - Unpreserved</b>							
MK_SB51_1.0,	MD_MW04_1.2,	----	----	----	07-NOV-2013	06-NOV-2013	1
MK_SB04_2.8							
<b>EP074B: Oxygenated Compounds</b>							
<b>Soil Glass Jar - Unpreserved</b>							
MK_SB87_1.0,	ML_MW15_3.0	06-NOV-2013	04-NOV-2013	2	07-NOV-2013	04-NOV-2013	3
<b>Soil Glass Jar - Unpreserved</b>							
MC_MW04_0.15		06-NOV-2013	05-NOV-2013	1	07-NOV-2013	05-NOV-2013	2
<b>Soil Glass Jar - Unpreserved</b>							
MK_SB51_1.0,	MD_MW04_1.2,	----	----	----	07-NOV-2013	06-NOV-2013	1
MK_SB04_2.8							
<b>EP074C: Sulfonated Compounds</b>							



Matrix: **SOIL**

Method Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
<b>EP074C: Sulfonated Compounds - Analysis Holding Time Compliance</b>						
<b>Soil Glass Jar - Unpreserved</b> MK_SB87_1.0, ML_MW15_3.0	06-NOV-2013	04-NOV-2013	2	07-NOV-2013	04-NOV-2013	3
<b>Soil Glass Jar - Unpreserved</b> MC_MW04_0.15	06-NOV-2013	05-NOV-2013	1	07-NOV-2013	05-NOV-2013	2
<b>Soil Glass Jar - Unpreserved</b> MK_SB51_1.0, MD_MW04_1.2, MK_SB04_2.8	----	----	----	07-NOV-2013	06-NOV-2013	1
<b>EP074D: Fumigants</b>						
<b>Soil Glass Jar - Unpreserved</b> MK_SB87_1.0, ML_MW15_3.0	06-NOV-2013	04-NOV-2013	2	07-NOV-2013	04-NOV-2013	3
<b>Soil Glass Jar - Unpreserved</b> MC_MW04_0.15	06-NOV-2013	05-NOV-2013	1	07-NOV-2013	05-NOV-2013	2
<b>Soil Glass Jar - Unpreserved</b> MK_SB51_1.0, MD_MW04_1.2, MK_SB04_2.8	----	----	----	07-NOV-2013	06-NOV-2013	1
<b>EP074E: Halogenated Aliphatic Compounds</b>						
<b>Soil Glass Jar - Unpreserved</b> MK_SB87_1.0, ML_MW15_3.0	06-NOV-2013	04-NOV-2013	2	07-NOV-2013	04-NOV-2013	3
<b>Soil Glass Jar - Unpreserved</b> MC_MW04_0.15	06-NOV-2013	05-NOV-2013	1	07-NOV-2013	05-NOV-2013	2
<b>Soil Glass Jar - Unpreserved</b> MK_SB51_1.0, MD_MW04_1.2, MK_SB04_2.8	----	----	----	07-NOV-2013	06-NOV-2013	1
<b>EP074F: Halogenated Aromatic Compounds</b>						
<b>Soil Glass Jar - Unpreserved</b> MK_SB87_1.0, ML_MW15_3.0	06-NOV-2013	04-NOV-2013	2	07-NOV-2013	04-NOV-2013	3
<b>Soil Glass Jar - Unpreserved</b> MC_MW04_0.15	06-NOV-2013	05-NOV-2013	1	07-NOV-2013	05-NOV-2013	2
<b>Soil Glass Jar - Unpreserved</b> MK_SB51_1.0, MD_MW04_1.2, MK_SB04_2.8	----	----	----	07-NOV-2013	06-NOV-2013	1
<b>EP074G: Trihalomethanes</b>						
<b>Soil Glass Jar - Unpreserved</b> MK_SB87_1.0, ML_MW15_3.0	06-NOV-2013	04-NOV-2013	2	07-NOV-2013	04-NOV-2013	3
<b>Soil Glass Jar - Unpreserved</b> MC_MW04_0.15	06-NOV-2013	05-NOV-2013	1	07-NOV-2013	05-NOV-2013	2
<b>Soil Glass Jar - Unpreserved</b> MK_SB51_1.0, MD_MW04_1.2, MK_SB04_2.8	----	----	----	07-NOV-2013	06-NOV-2013	1



### ***Outliers : Frequency of Quality Control Samples***

The following report highlights breaches in the Frequency of Quality Control Samples.

- **No Quality Control Sample Frequency Outliers exist.**
-

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

<b>Work Order</b>	: <b>ES1323862</b>		
<b>Client</b>	: <b>ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: MR JONATHAN LEKAWSKI	<b>Contact</b>	: Barbara Hanna
<b>Address</b>	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: jonathan.lekawski@erm.com	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: 0207423 SYMPHONY	<b>Page</b>	: 1 of 3
<b>Order number</b>	: ----	<b>Quote number</b>	: ES2013ENVRES0370 (SY/278/13 V3)
<b>C-O-C number</b>	: 11729,11730	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b>	: MT.PIPER		
<b>Sampler</b>	: GP		

#### Dates

<b>Date Samples Received</b>	: 05-NOV-2013	<b>Issue Date</b>	: 06-NOV-2013 11:51
<b>Client Requested Due Date</b>	: 11-NOV-2013	<b>Scheduled Reporting Date</b>	: <b>11-NOV-2013</b>

#### Delivery Details

<b>Mode of Delivery</b>	: Carrier	<b>Temperature</b>	: 5°C - Ice present
<b>No. of coolers/boxes</b>	: 7 HARDS	<b>No. of samples received</b>	: 39
<b>Security Seal</b>	: Intact.	<b>No. of samples analysed</b>	: 37

#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Asbestos analysis will be conducted by ALS Newcastle.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Sample " MK\_SB07\_1.0 " ( ALS #39 ) was received extra and placed on hold.**
- **Sample T\_281013\_01\_GP forwarded to Envirolab.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- No sample container / preservation non-compliance exist.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: SOIL

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA200 Asbestos Identification in Soils	SOIL - EGO05T (solids) Total Metals by ICP-AES	SOIL - EP066 (solids) Polychlorinated Biphenyls by GCMS	SOIL - EP074 (solids) Volatile Organic Compounds	SOIL - S-18 (NO MOIST) TRH(C6-C9)/BTXN with No Moisture for TBs	SOIL - S-27 TRH(BTEXN)/PAH/Phenols/0Metals
ES1323862-001	28-OCT-2013 15:00	MK_SB11_1.0		✓	✓				✓
ES1323862-002	28-OCT-2013 15:00	MK_SB04_0.2		✓	✓				✓
ES1323862-003	28-OCT-2013 15:00	MK_SB87_0.5		✓					
ES1323862-004	28-OCT-2013 15:00	MK_SB87_1.0			✓	✓	✓		✓
ES1323862-005	28-OCT-2013 15:00	TRIP SPIKE						✓	
ES1323862-006	28-OCT-2013 15:00	MK_SB05_0.5		✓	✓				✓
ES1323862-007	28-OCT-2013 15:00	D_281013_01_GP			✓				✓
ES1323862-008	28-OCT-2013 15:00	MK_SB06_0.2		✓	✓				✓
ES1323862-009	28-OCT-2013 15:00	MK_SB02_0.5		✓	✓				✓
ES1323862-010	28-OCT-2013 15:00	ML_MW15_3.0			✓	✓	✓		✓
ES1323862-011	29-OCT-2013 15:00	MK_SB47_0.5		✓	✓				✓
ES1323862-012	29-OCT-2013 15:00	MK_SB46_1.0		✓	✓				✓
ES1323862-013	29-OCT-2013 15:00	MC_MW04_0.15		✓	✓	✓	✓		✓
ES1323862-014	29-OCT-2013 15:00	MK_SB82_0.2		✓	✓				✓
ES1323862-015	29-OCT-2013 15:00	MK_SB81_1.0		✓	✓				✓
ES1323862-016	29-OCT-2013 15:00	MK_SB86_0.5		✓	✓				✓
ES1323862-017	29-OCT-2013 15:00	MK_SB76_0.5			✓				✓
ES1323862-018	29-OCT-2013 15:00	MK_SB58_0.1		✓	✓				✓
ES1323862-019	29-OCT-2013 15:00	MK_SB76_0.2		✓					
ES1323862-020	30-OCT-2013 15:00	MK_SB51_1.0		✓	✓	✓	✓		✓
ES1323862-021	30-OCT-2013 15:00	MD_MW04_0.5		✓					
ES1323862-022	30-OCT-2013 15:00	MD_MW04_1.2			✓	✓	✓		✓
ES1323862-023	30-OCT-2013 15:00	MC_MW01_0.2		✓	✓				✓
ES1323862-024	30-OCT-2013 15:00	MK_SB17_1.5			✓				✓
ES1323862-025	30-OCT-2013 15:00	MK_SB04_2.8			✓	✓	✓		✓
ES1323862-026	30-OCT-2013 15:00	MK_SB09_1.15			✓				✓
ES1323862-027	30-OCT-2013 15:00	MD_MW01_2.0			✓				✓
ES1323862-028	31-OCT-2013 15:00	MK_SB87_3.0			✓	✓	✓		✓
ES1323862-029	31-OCT-2013 15:00	D_311013_01_GP			✓	✓	✓		✓
ES1323862-030	31-OCT-2013 15:00	T_311013_01_GP			✓	✓	✓		✓
ES1323862-031	31-OCT-2013 15:00	MC_MW04_3.0			✓	✓	✓		✓
ES1323862-032	31-OCT-2013 15:00	MK_SB47_3.0			✓				✓
ES1323862-033	31-OCT-2013 15:00	MK_SB46_2.0			✓				✓
ES1323862-034	31-OCT-2013 15:00	MK_SB02_1.5			✓				✓
ES1323862-035	31-OCT-2013 15:00	MK_SB51_1.5	✓						



			(On Hold) SOIL No analysis requested	SOIL - EA200 Asbestos Identification in Soils	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP066 (solids) Polychlorinated Biphenyls by GCMS	SOIL - EP074 (solids) Volatile Organic Compounds	SOIL - S-18 (NO MOIST) TRH(C6-C9)/BTEXN with No Moisture for TBs	SOIL - S-27 TRH/BTEXN/PAH/Phenols/6Metals
ES1323862-036	31-OCT-2013 15:00	MK_SB51_3.0			✓	✓	✓		✓
ES1323862-037	31-OCT-2013 15:00	TRIP BLANK						✓	
ES1323862-038	31-OCT-2013 15:00	TSC						✓	
ES1323862-039	28-OCT-2013 15:00	MK_SB07_1.0	✓						

### Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: **SOIL**

Evaluation: ✘ = Holding time breach ; ✔ = Within holding time.

Method		Due for extraction	Due for analysis	Samples Received		Instructions Received	
Client Sample ID(s)	Container			Date	Evaluation	Date	Evaluation
<b>EP074: Volatile Organic Compounds</b>							
MK_SB87_1.0	Soil Glass Jar - Unpreserved	04-NOV-2013	----	05-NOV-2013	✘	----	----
ML_MW15_3.0	Soil Glass Jar - Unpreserved	04-NOV-2013	----	05-NOV-2013	✘	----	----

### Requested Deliverables

#### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

#### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com

#### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

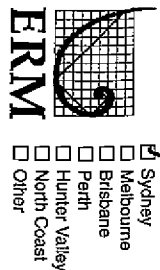
Email symphony.deltawest@erm.com  
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Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com

#### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com





Sydney  
 Melbourne  
 Brisbane  
 Perth  
 Hunter Valley  
 North Coast  
 Other

Grand Floor, 33 Saunders Street, Pyrmont, NSW, 2009, (ph) 02 8584 8888 (fax) 02 8584 8800  
 Level 3, Yarra Tower, WTC, 18-38 Stoddley Street, Docklands, VIC, 3005, (ph) 03 9696 8011 (fax) 03 9696 8022  
 Level 1, 60 Leichardt Street, Spring Hill, QLD, 4004, (ph) 07 3839 8393 (fax) 07 3839 8381  
 Level 6, Grain Pool Bld, 172 St Georges Tce, WA, 6550, (ph) 08 9321 5200 (fax) 08 9321 5282  
 53 Bonville Avenue, Thornton, NSW, 2322, (ph) 02 4964 2150 (fax) 02 4964 2152  
 Suite 37/46 Gordon Street, Port Macquarie, NSW, 2444, (ph) 02 6584 7156 (fax) 02 6584 7160

**General Analysis Requirements**

1. Turn Around Time (please tick:  1 Day  2 Days  3 Days  Normal TAT)
2. Do you wish any sediment layers in water to be excluded from extractions?
3. Additional QAVQC reported where sample batches are < 10 samples?
4. % of extraneous material removed from samples to be reported as per NEPM 5.1.17?

Laboratory Number	Sample ID	Sample Depth	Sample Date	Sample Time	Matrix					Containers (number/type)	BTEX	TPH (C6-C9 P & T) + TPH (C10-C36)	Speciated TPH	VOC Scan (USEPA 8260 List)	SVOC Scan (USEPA 8270 List)	OC OP Pesticides	PAH	Phenols	PCB	Metals* (dissolved / total)	Asbestos	VOC scan	HOLD	TRH C6-C9
					Soil	Water	Other	Ice	Acid															
1	MK-SB11-1.0		28/10		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	MK-SB09-0.2				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3	MK-SB09-0.5				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4	MK-SB09-1.0				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	<del>MK-SB05-0.5</del> TRIP spike				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	MK-SB05-0.5				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7	D281815_01-CIP				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8	D281813_01-CIP				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9	MK-SB02-0.5				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10	ML-01W1530		28/10		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
11	MK-SB47-0.5		29/10		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12	MK-SB46-1.0				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
13	MK-MW04-0.15				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14	MK-SB82-0.2				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
15	MK-SB81-1.0				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16	MK-SB86-0.5				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
17	MK-SB76-0.5				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18	MK-SB58-0.1				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Comments: quote # SY/272/13 email [sydney@ermlab.com](mailto:sydney@ermlab.com) deliver west @ermlab.com

Relinquished by: Gavin Powell Signed: *[Signature]* Date/Time: 4/11/13 1515 Received by: Stern Date/Time: 5/11/13 9:00

Metals (total): AS Cd Cr Cu Hg Ni Pb Zn Se

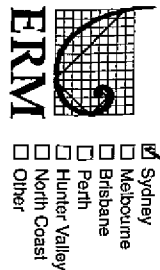
Environmental Division  
 Sydney  
 Work Order  
**ES1323862**  
  
 Telephone : + 61-2-8764 8555

to forward please

Project No: 0267423  
 Project Name: *Symphony*  
 Project Location: *Mt. Piper*  
 Project Manager: *Jenathana Lkanski*  
 Sampler: *Gavin Powell*  
 Laboratory: *ALS*  
 COC Number: **A 11729**

Other Comments on sample (eg: high voc, highly contaminated, special detection limits etc etc)

Relinquished by: Signed: Date/Time: Received by: Date/Time:



Sydneys  
 Melbourne  
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 Perth  
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 Other

Gind Floor, 33 Saunders Street, Pyrmont, NSW, 2009, (ph) 02 8584 8888 (fax) 02 8584 8900  
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 53 Bonville Avenue, Thornton, NSW, 2322, (ph) 02 4964 2150 (fax) 02 4964 2152  
 Suite 3/146 Gordon Street, Port Macquarie, NSW, 2444, (ph) 02 6584 7155 (fax) 02 6584 7160

General Analysis Requirements  
 1. Turn Around Time (please tick):  1 Day  2 Days  3 Days  Normal (TAT)  
 2. Do you wish any sediment layers in water to be excluded from extractions?  
 3. Additional QAVQC reported where sample batches are < 10 samples?  
 4. % of extraneous material removed from samples to be reported as per NEPM 5.1.17?

Laboratory Number	Sample ID	Sample Depth	Sample Date	Sample Time	Matrix			Preservation			Containers (number/type)	BTEX	TPH (C6-C9 P & T) + TPH (C10-C38)	Speciated TPH	VOC Scan (USEPA 8260 List)	SVOC Scan (USEPA 8270 List)	OC OP Pesticides	PAH	Phenols	PCB	Metals* (dissolved / total)	Asbestos	VOC scan	HOLD	TRH (5-6)	Other Comments on sample (eg: high voc, highly contaminated, special detection limits etc etc)	
					Soil	Water	Other	Ice	Acid	Filter																	Other
19	MK-SR4-02		29/10		X			X			1																
20	MK-SR5L1-0		30/10		X			X			2																
21	MD-MN09-05				X			X			1																
22	MD-MN04-112				X			X			1																
23	MK-MK01-02				X			X			2																
24	MK-SR17-15				X			X			1																
25	MK-SR04-28				X			X			1																
26	MK-SR09-115				X			X			1																
27	MD-MN01-28		30/10		X			X			1																
28	MK-SR07-310		31/10		X			X			1																
29	D-311013-01-CF				X			X			1																
30	T-311013-01-CF				X			X			1																
31	MK-MN04-310				X			X			1																Conduct Metals
32	MK-SR47-310				X			X			1																Conduct Phenols
33	MK-SR46-210				X			X			1																Conduct Phenols
34	MK-SR02-15				X			X			1																
35	MK-SR51-115				X			X			1																
36	MK-SR51-310				X			X			1																
37	Trip Blank				X			X			1																

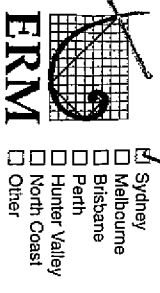
Comments: quote SY/278/15, email [syphony.delfarwest@erm.com](mailto:symphony.delfarwest@erm.com)

Relinquished by: Gavin Powell  
 Signed:   
 Date/Time: 4/11/13 1515

Relinquished by:   
 Signed:   
 Date/Time:   
 Received by:   
 Date/Time:

\*Metals (circle)  
 As Cd Cr Cu Hg Ni Pb Zn **Se**

Project No: 020423  
 Project Name: Symphony  
 Project Location: Mt. Kier  
 Project Manager: Jani Hon Leksowski  
 Sampler: Gavin Powell  
 COC Number: A 11730  
 Laboratory: ALS



Sydney  
 Melbourne  
 Brisbane  
 Perth  
 Hunter Valley  
 North Coast  
 Other

Grind Floor, 33 Saunders Street, Pyrmont, NSW, 2009. (ph) 02 8584 8888 (fax) 02 8584 8800  
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 53 Bonville Avenue, Thornhill, NSW, 2822. (ph) 02 4964 2150 (fax) 02 4964 2152  
 Suite 3/146 Gordon Street, Port Macquarie, NSW, 2444. (ph) 02 6584 7155 (fax) 02 6584 7160

General Analysis Requirements

1. Turn Around Time (please tick):  1 Day  2 Days  3 Days (Normal TAT)
2. Do you wish any sediment layers in water to be excluded from extractions?
3. Additional QA/QC reported where sample batches are < 10 samples?
4. % of extraneous material removed from samples to be reported as per NEPM 5.1.1?

Laboratory Number	Sample ID	Sample Depth	Sample Date	Sample Time	Preservation							Containers (numb/typ)	BTEX	TPH (C6-C9 P & T) + TPH (C10-C36)	Speciated TPH	VOC Scan (USEPA 8260 List)	SVOC Scan (USEPA 8270 List)	OC OP Pesticides	PAH	Phenols	PCB	Metals* (dissolved / total)	Asbestos	VOC scan	HOLD	TRM C6-C9	Other Comments on sample (eg: high voc, highly contaminated, special detection limits etc etc)
					Soil	Water	Other	Ice	Acid	Filter	Other																
1	MK-SB11-1.0		28/10		X	X	X	X	X	X	X	2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
2	MK-SB09-0.2				X	X	X	X	X	X	X	2	X	X	X	X	X	X	X	X	X	X	X	X	X		
3	MK-SB09-0.5				X	X	X	X	X	X	X	1	X	X	X	X	X	X	X	X	X	X	X	X	X		
4	MK-SB09-1.0				X	X	X	X	X	X	X	1	X	X	X	X	X	X	X	X	X	X	X	X	X		
5	<del>MK-SB05-0.5</del> TRIP spike				X	X	X	X	X	X	X	1	X	X	X	X	X	X	X	X	X	X	X	X	X		
6	MK-SB05-0.5				X	X	X	X	X	X	X	2	X	X	X	X	X	X	X	X	X	X	X	X	X		
7	D281013_01_CP				X	X	X	X	X	X	X	1	X	X	X	X	X	X	X	X	X	X	X	X	X		
8	MK-SB06-0.2				X	X	X	X	X	X	X	2	X	X	X	X	X	X	X	X	X	X	X	X	X		
9	MK-SB02-0.5				X	X	X	X	X	X	X	2	X	X	X	X	X	X	X	X	X	X	X	X	X		
10	ML-11M153-0		28/10		X	X	X	X	X	X	X	1	X	X	X	X	X	X	X	X	X	X	X	X	X		
11	MK-SB09-0.5		29/10		X	X	X	X	X	X	X	2	X	X	X	X	X	X	X	X	X	X	X	X	X		
12	MK-SB16-1.0				X	X	X	X	X	X	X	2	X	X	X	X	X	X	X	X	X	X	X	X	X		
13	MK-MK04-0.15				X	X	X	X	X	X	X	2	X	X	X	X	X	X	X	X	X	X	X	X	X		
14	MK-SB02-0.2				X	X	X	X	X	X	X	2	X	X	X	X	X	X	X	X	X	X	X	X	X		
15	MK-SB81-1.0				X	X	X	X	X	X	X	2	X	X	X	X	X	X	X	X	X	X	X	X	X		
16	MK-SB06-0.5				X	X	X	X	X	X	X	2	X	X	X	X	X	X	X	X	X	X	X	X	X		
17	MK-SB16-0.5				X	X	X	X	X	X	X	1	X	X	X	X	X	X	X	X	X	X	X	X	X		
18	MK-SB08-0.1				X	X	X	X	X	X	X	2	X	X	X	X	X	X	X	X	X	X	X	X	X		

Comments: quote # SY/272/13 equal signifying old lowest @ arm.com

Relinquished by: Gavin Powell  
 Signed: [Signature]  
 Date/Time: 4/11/13 1515

Relinquished by: Gavin Powell  
 Signed: [Signature]  
 Date/Time: 5/11/13 9:00

Project No: 0267423  
 Project Name: Symphony  
 Project Location: Mt Piper  
 Project Manager: Janina Lekowski  
 Sampler: Gavin Powell

COC Number: A 11729  
 Laboratory: ALS

Environmental Division  
 Sydney  
 Work Order  
**ES1323862**  
 Telephone: +61-2-8764 8555

Metals (trace)  
 As Cd Cr Cu Hg Ni Pb Zn Se

Subson / [Signature]  
 Date: 4/11/13  
 Organised by: [Signature]  
 Requiring by: [Signature]  
 W/D No: 681281862  
 Each By: [Signature]

to Gavriob please



Grand Floor, 33 Saunders Street, Pyrmont, NSW, 2009. (ph) 02 8594 8888 (fax) 02 8594 8800  
 Level 3, Yarra Tower, WTC, 18-38 Siddaley Street, Docklands VIC, 3005. (ph) 03 9696 8011 (fax) 03 9696 8022  
 Level 1, 60 Letchford Street, Spring Hill, QLD, 4004. (ph) 07 3839 8393 (fax) 07 3839 8381  
 Level 6, Grain Pool Bld, 172 St Georges Ter, WA, 6850. (ph) 08 9321 5200 (fax) 08 9321 5262  
 53 Bonville Avenue, Thornton, NSW, 2322. (ph) 02 4964 2150 (fax) 02 4964 2152  
 Suite 3/149 Gordon Street, Port Macquarie, NSW, 2444. (ph) 02 6584 7155 (fax) 02 6584 7160

Project No: 0204423  
 Project Name: Synphony  
 Project Location: Mt. Kisco  
 Project Manager: Jonathan Lukowski  
 Sampler: Gavin Powell

COC Number: A 11730  
 Laboratory: ALS

General Analysis Requirements

1. Turn Around Time (please tick):  1 Day  2 Days  3 Days  Normal (TAT)
2. Do you wish any sediment layers in water to be excluded from extractions?
3. Additional QA/QC reported where sample batches are < 10 samples?
4. % of extraneous material removed from samples to be reported as per NIEPM 5.1.1?

Laboratory Number	Sample ID	Sample Depth	Sample Date	Sample Time	Matrix			Preservation			Containers (number/type)	BTEX	TPH (C6-C9 P & T) + TPH (C10-C36)	Speciated TPH	VOC Scan (USEPA 8260 List)	SVOC Scan (USEPA 8270 List)	OC OP Pesticides	PAH	Phenols	PCB	Metals* (dissolved / total)	Asbestos	VOC scan	HOLD	H2C (C-6)	Other Comments on sample (eg. high voc, highly contaminated, special detection limits etc etc)	
					Water	Ice	Acid	Filter	Other																		
19	MK-SB16-02		29/10		X			X			1																
20	MK-SB51-1-0		30/10		X			X			2																
21	MD-MN04-05				X			X			1																
22	MD-MN04-1-2				X			X			1																
23	MC-MN01-0-2				X			X			2																
24	MK-SB17-1-5				X			X			1																
25	MC-SB04-2-8				X			X			1																
26	MK-SB09-1-15				X			X			1																
27	MD-MN01-2-0		30/10		X			X			1																
28	MK-SB07-3-0		31/10		X			X			1																
29	MD-MN01-2-0				X			X			1																
30	MD-MN01-2-0				X			X			1																
31	MC-MN04-3-0				X			X			1																Conduct Metals
32	MK-SB47-3-0				X			X			1																Conduct Metals
33	MK-SB46-2-0				X			X			1																Conduct Metals
34	MK-SB02-1-5				X			X			1																
35	MK-SB51-1-5				X			X			1																
36	MK-SB51-3-0				X			X			1																
37	Trap Blank				X			X			1																

Comments: 38<sup>th</sup> trap geoche SY/278/15, email synphony.deltawest@erm.com

Relinquished by: Gavin Powell  
 Signed: [Signature]  
 Date/Time: 4/11/13 1515

Received by: [Signature]  
 Date/Time: [Blank]  
 Received by: [Signature]  
 Date/Time: [Blank]

\*Metals (trace)  
 As Cd Cr Cu Hg Ni Pb Zn

Se

## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>ES1324233</b> <b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : MR JONATHAN LEKAWSKI <b>Address</b> : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007  <b>E-mail</b> : jonathan.lekawski@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800 <b>Project</b> : SYMPHONY-MP <b>Order number</b> : 0207423 <b>C-O-C number</b> : ---- <b>Sampler</b> : TS/GP <b>Site</b> : ----  <b>Quote number</b> : SY/278/13 V3	<b>Page</b> : 1 of 9  <b>Laboratory</b> : Environmental Division Sydney <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164  <b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555 <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement  <b>Date Samples Received</b> : 08-NOV-2013 <b>Issue Date</b> : 18-NOV-2013  <b>No. of samples received</b> : 17 <b>No. of samples analysed</b> : 9
---	--

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

### *Signatories*

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Shaun Spooner	Laboratory Technician	Newcastle - Asbestos



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EA200 Legend**
- **EA200 'Am' Amosite (brown asbestos)**
- **EA200 'Ch' Chrysotile (white asbestos)**
- **EA200 'Cr' Crocidolite (blue asbestos)**
- **EA200 'Trace' - Asbestos fibres detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres**
- **EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.**
- **EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.**
- **EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.**
- **EP080: The TRIP SPIKE and TRIP SPIKE CONTROL have been analysed for volatile TPH and BTEX only. The TRIP SPIKE and TRIP SPIKE CONTROL were prepared in the lab using reagent grade sand spiked with petrol. The TRIP SPIKE was dispatched from the lab and the TRIP SPIKE CONTROL retained. The spike samples were extracted and analysed concurrently with samples reported in this batch.**



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				TRIP SPIKE 13	TRIP BLANK	MK_SB84_0.2	MK_SB62_0.2	MK_SB43_0.2
				30-OCT-2013 15:00	30-OCT-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324233-001	ES1324233-002	ES1324233-003	ES1324233-004	ES1324233-005
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	----	----	10.1	15.2	7.9
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	----	----	No	No	No
Asbestos Type	1332-21-4	0.1	--	----	----	-	-	-
Sample weight (dry)	----	0.01	g	----	----	228	224	237
APPROVED IDENTIFIER:	----	-	--	----	----	S.SPOONER	S.SPOONER	S.SPOONER
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	----	----	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	----	----	8	10	12
Cadmium	7440-43-9	1	mg/kg	----	----	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	----	----	10	15	11
Copper	7440-50-8	5	mg/kg	----	----	15	19	23
Lead	7439-92-1	5	mg/kg	----	----	17	17	25
Nickel	7440-02-0	2	mg/kg	----	----	21	43	34
Zinc	7440-66-6	5	mg/kg	----	----	59	76	130
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	----	----	<0.1	<0.1	<0.1
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	----	----	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	----	----	<2	<2	<2
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	----	----	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				TRIP SPIKE 13	TRIP BLANK	MK_SB84_0.2	MK_SB62_0.2	MK_SB43_0.2
				30-OCT-2013 15:00	30-OCT-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324233-001	ES1324233-002	ES1324233-003	ES1324233-004	ES1324233-005
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Acenaphthene	83-32-9	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	----	----	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	----	----	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<b>91</b>	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	----	----	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	----	----	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	----	----	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	----	----	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<b>102</b>	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<b>59</b>	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	----	----	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	----	----	<100	<b>100</b>	<100
>C34 - C40 Fraction	----	100	mg/kg	----	----	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	----	----	<50	<b>100</b>	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	----	----	<50	<50	<50





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				TRIP SPIKE 13	TRIP BLANK	MK_SB84_0.2	MK_SB62_0.2	MK_SB43_0.2
				30-OCT-2013 15:00	30-OCT-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324233-001	ES1324233-002	ES1324233-003	ES1324233-004	ES1324233-005
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	0.6	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	21.8	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	2.6	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	12.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	5.1	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	42.6	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	17.6	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	----	----	92.9	75.6	76.0
2-Chlorophenol-D4	93951-73-6	0.1	%	----	----	99.2	88.6	89.0
2,4,6-Tribromophenol	118-79-6	0.1	%	----	----	105	92.3	94.5
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	----	----	102	91.5	94.0
Anthracene-d10	1719-06-8	0.1	%	----	----	96.6	87.2	89.3
4-Terphenyl-d14	1718-51-0	0.1	%	----	----	89.6	81.3	82.6
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	114	122	116	127	115
Toluene-D8	2037-26-5	0.1	%	111	120	97.0	112	105
4-Bromofluorobenzene	460-00-4	0.1	%	111	122	81.5	84.9	86.9



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				MK_SB44_0.2	D01_061113_TS	T01_061113_TS	TSC	----
Client sampling date / time				06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1324233-006	ES1324233-007	ES1324233-008	ES1324233-017	----
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	6.1	9.2	6.4	----	----
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	----	----	----	----
Asbestos Type	1332-21-4	0.1	--	-	----	----	----	----
Sample weight (dry)	----	0.01	g	263	----	----	----	----
APPROVED IDENTIFIER:	----	-	--	S.SPOONER	----	----	----	----
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	----	----
Arsenic	7440-38-2	5	mg/kg	8	9	9	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	----	----
Chromium	7440-47-3	2	mg/kg	12	10	9	----	----
Copper	7440-50-8	5	mg/kg	18	16	16	----	----
Lead	7439-92-1	5	mg/kg	21	17	18	----	----
Nickel	7440-02-0	2	mg/kg	36	36	31	----	----
Zinc	7440-66-6	5	mg/kg	86	70	66	----	----
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	----	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB44_0.2	D01_061113_TS	T01_061113_TS	TSC	----
				06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1324233-006	ES1324233-007	ES1324233-008	ES1324233-017	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	----	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<b>80</b>	----
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<b>87</b>	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<b>52</b>	----
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				MK_SB44_0.2	D01_061113_TS	T01_061113_TS	TSC	----
Client sampling date / time				06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1324233-006	ES1324233-007	ES1324233-008	ES1324233-017	----
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	0.6	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	19.6	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	1.8	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	9.4	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	3.6	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	35.0	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	13.0	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	85.8	84.3	84.4	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	93.5	90.7	91.0	----	----
2,4,6-Tribromophenol	118-79-6	0.1	%	94.8	92.2	93.3	----	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	94.7	92.9	94.1	----	----
Anthracene-d10	1719-06-8	0.1	%	90.8	88.0	89.4	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	85.4	83.5	84.2	----	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	123	125	118	106	----
Toluene-D8	2037-26-5	0.1	%	114	106	94.7	84.1	----
4-Bromofluorobenzene	460-00-4	0.1	%	91.6	88.2	81.7	76.7	----

## Analytical Results

### Descriptive Results

Sub-Matrix: SOIL

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>		
EA200: Description	MK_SB84_0.2 - 06-NOV-2013 15:00	Mid grey-brown soil with grey and orange rocks plus a trace of vegetation
EA200: Description	MK_SB62_0.2 - 06-NOV-2013 15:00	Mid grey-brown soil with grey rocks plus some vegetation
EA200: Description	MK_SB43_0.2 - 06-NOV-2013 15:00	Mid grey-brown soil with grey and orange rocks plus a trace of vegetation
EA200: Description	MK_SB44_0.2 - 06-NOV-2013 15:00	Mid grey-brown soil with grey and orange rocks plus a trace of vegetation



## Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: ES1324233</b>	<b>Page</b>	: 1 of 14
<b>Client</b>	<b>: ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: MR JONATHAN LEKAWSKI	<b>Contact</b>	: Barbara Hanna
<b>Address</b>	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: jonathan.lekawski@erm.com	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: SYMPHONY-MP	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b>	: ----	<b>Date Samples Received</b>	: 08-NOV-2013
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: 18-NOV-2013
<b>Sampler</b>	: TS/GP	<b>No. of samples received</b>	: 17
<b>Order number</b>	: 0207423	<b>No. of samples analysed</b>	: 9
<b>Quote number</b>	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

### *Signatories*

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

#### *Signatories*

Celine Conceicao  
Pabi Subba  
Shaun Spooner

#### *Position*

Senior Spectroscopist  
Senior Organic Chemist  
Laboratory Technician

#### *Accreditation Category*

Sydney Inorganics  
Sydney Organics  
Newcastle - Asbestos



### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :            Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
                  CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
                  LOR = Limit of reporting  
                  RPD = Relative Percentage Difference  
                  # = Indicates failed QC



## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EA055: Moisture Content (QC Lot: 3154514)</b>									
EB1327443-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	2.3	1.6	37.5	No Limit
EP1308433-003	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	<1.0	<1.0	0.0	No Limit
<b>EA055: Moisture Content (QC Lot: 3154515)</b>									
ES1324233-007	D01_061113_TS	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	9.2	8.8	4.7	No Limit
ES1324267-008	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	10.1	8.6	15.2	0% - 50%
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3155649)</b>									
ES1323683-018	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	10	9	16.7	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	5	<5	0.0	No Limit
ES1324197-034	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	11	14	28.4	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	8	11	35.4	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	8	19.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	11	16	37.2	No Limit
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3155651)</b>									
ES1324233-007	D01_061113_TS	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	10	8	24.1	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	36	33	9.6	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	9	8	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	16	16	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	17	17	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	70	65	6.9	0% - 50%
ES1324260-020	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	12	12	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	16	15	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	12	9	20.5	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	24	21	16.0	No Limit





Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3155651) - continued</b>									
ES1324260-020	Anonymous	EG005T: Lead	7439-92-1	5	mg/kg	14	15	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	60	54	9.6	0% - 50%
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3155650)</b>									
ES1323683-018	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1324197-034	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3155652)</b>									
ES1324233-007	D01_061113_TS	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1324260-020	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3152166)</b>									
ES1324233-003	MK_SB84_0.2	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
		ES1324338-001	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5
EP075(SIM): 2-Chlorophenol	95-57-8			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2-Methylphenol	95-48-7			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2-Nitrophenol	88-75-5			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2.4-Dimethylphenol	105-67-9			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2.4-Dichlorophenol	120-83-2			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2.6-Dichlorophenol	87-65-0			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 3- & 4-Methylphenol	1319-77-3			1	mg/kg	<1	<1	0.0	No Limit
EP075(SIM): Pentachlorophenol	87-86-5			2	mg/kg	<2	<2	0.0	No Limit
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3152166)</b>									
ES1324233-003	MK_SB84_0.2	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3152166) - continued</b>									
ES1324233-003	MK_SB84_0.2	EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1324338-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3151111)</b>									
ES1324197-036	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1324233-008	T01_061113_TS	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3152165)</b>									
ES1324233-003	MK_SB84_0.2	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3152165) - continued</b>									
ES1324338-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3161908)</b>									
ES1324938-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	68	79	14.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3151111)</b>									
ES1324197-036	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES1324233-008	T01_061113_TS	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3152165)</b>									
ES1324233-003	MK_SB84_0.2	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
ES1324338-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3161908)</b>									
ES1324938-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	138	156	12.1	0% - 50%
<b>EP080: BTEXN (QC Lot: 3151111)</b>									
ES1324197-036	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES1324233-008	T01_061113_TS	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3161908)</b>									
ES1324938-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	0.6	20.8	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	9.5	10.0	5.5	0% - 50%
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	4.8	5.4	11.5	0% - 50%

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 Work Order : ES1324233  
 Client : ENVIRO RESOURCES MANAGEMENT  
 Project : SYMPHONY-MP



Sub-Matrix: **SOIL**

*Laboratory Duplicate (DUP) Report*

<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>LOR</i>	<i>Unit</i>	<i>Original Result</i>	<i>Duplicate Result</i>	<i>RPD (%)</i>	<i>Recovery Limits (%)</i>
<b>EP080: BTEXN (QC Lot: 3161908) - continued</b>									
ES1324938-001	Anonymous	EP080: Naphthalene	91-20-3	1	mg/kg	2	2	0.0	No Limit



### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3155649)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	98.0	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	97.1	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	103	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	108	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	96.2	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	107	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	94.9	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	101	81	133	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3155651)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	106	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	101	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	106	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	104	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	101	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	110	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	86.9	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	108	81	133	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3155650)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	74.1	66	112	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3155652)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	71.6	66	112	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3152166)</b>									
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	95.7	74	116	
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	99.5	74	116	
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	100	72	116	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	105	69	123	
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	89.7	60.3	117	
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	101	69	117	
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	91.0	68	112	
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	98.8	73	117	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	85.2	76.4	114	
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	91.4	57	111	
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	86.9	68.9	112	
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	46.7	3.9	57	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3152166)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	104	80	124	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	113	77	123	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	111	79	123	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	112	77	123	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	112	79	123	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	111	79	123	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	111	79	123	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	112	79	125	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	99.1	73	121	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	104	81	123	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	92.0	70	118	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	109	77	123	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	109	76	122	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	92.5	71	113	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	92.0	71.7	113	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	89.3	72.4	114	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3151111)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	99.4	68.4	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3152165)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	82.8	71	131	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	90.1	74	138	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	89.0	64	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3161908)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	108	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3151111)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	96.7	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3152165)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	84.1	70	130	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	91.1	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	
		50	mg/kg	----	150 mg/kg	84.2	63	131	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3161908)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	106	68.4	128	
<b>EP080: BTEXN (QCLot: 3151111)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	108	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	101	62	128	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	92.4	58	118	



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit		Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%)	
				Result		Low	High	
<b>EP080: BTEXN (QCLot: 3151111) - continued</b>								
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	92.4	60	120
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	86.0	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	90.4	62	138
<b>EP080: BTEXN (QCLot: 3161908)</b>								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	115	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	114	62	128
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	107	58	118
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	106	60	120
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	106	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	109	62	138

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Low	High
<b>EG005T: Total Metals by ICP-AES (QCLot: 3155649)</b>							
ES1323683-018	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	97.0	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	98.2	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	100	70	130
		EG005T: Copper	7440-50-8	125 mg/kg	101	70	130
		EG005T: Lead	7439-92-1	125 mg/kg	98.4	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	102	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	94.2	70	130
		EG005T: Zinc	7440-66-6	125 mg/kg	96.7	70	130
<b>EG005T: Total Metals by ICP-AES (QCLot: 3155651)</b>							
ES1324233-007	D01_061113_TS	EG005T: Arsenic	7440-38-2	50 mg/kg	98.7	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	101	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	98.5	70	130
		EG005T: Copper	7440-50-8	125 mg/kg	103	70	130
		EG005T: Lead	7439-92-1	125 mg/kg	102	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	103	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	99.0	70	130
		EG005T: Zinc	7440-66-6	125 mg/kg	99.1	70	130





Sub-Matrix: SOIL				Matrix Spike (MS) Report				
				Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3155650)</b>								
ES1323683-018	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	88.5	70	130	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3155652)</b>								
ES1324233-007	D01_061113_TS	EG035T: Mercury	7439-97-6	5 mg/kg	89.3	70	130	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3152166)</b>								
ES1324233-003	MK_SB84_0.2	EP075(SIM): Phenol	108-95-2	10 mg/kg	88.1	70	130	
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	89.0	70	130	
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	84.5	60	130	
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	83.2	70	130	
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	85.7	20	130	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3152166)</b>								
ES1324233-003	MK_SB84_0.2	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	99.4	70	130	
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	106	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3151111)</b>								
ES1324197-036	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	99.2	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3152165)</b>								
ES1324233-003	MK_SB84_0.2	EP071: C10 - C14 Fraction	----	640 mg/kg	75.0	73	137	
		EP071: C15 - C28 Fraction	----	3140 mg/kg	84.8	53	131	
		EP071: C29 - C36 Fraction	----	2860 mg/kg	76.7	52	132	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3161908)</b>								
ES1324938-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	106	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3151111)</b>								
ES1324197-036	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	94.8	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3152165)</b>								
ES1324233-003	MK_SB84_0.2	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	99.2	73	137	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	81.9	53	131	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	60.8	52	132	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3161908)</b>								
ES1324938-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	94.4	70	130	
<b>EP080: BTEXN (QCLot: 3151111)</b>								
ES1324197-036	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	102	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	102	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	88.1	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	85.1	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	86.7	70	130	
		EP080: Naphthalene	91-20-3	2.5 mg/kg	84.0	70	130	





Sub-Matrix: SOIL

				Matrix Spike (MS) Report				
				Spike Concentration	Spike Recovery(%) MS	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EP080: BTEXN (QCLot: 3161908)</b>								
ES1324938-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	91.7	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	105	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	116	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	89.3	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	102	70	130	
	EP080: Naphthalene	91-20-3	2.5 mg/kg	99.1	70	130		

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3151111)</b>											
ES1324197-036	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	99.2	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3151111)</b>											
ES1324197-036	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	94.8	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3151111)</b>											
ES1324197-036	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	102	----	70	130	----	----	
		EP080: Toluene	108-88-3	2.5 mg/kg	102	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	88.1	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	85.1	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	86.7	----	70	130	----	----	
	EP080: Naphthalene	91-20-3	2.5 mg/kg	84.0	----	70	130	----	----		
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3152165)</b>											
ES1324233-003	MK_SB84_0.2	EP071: C10 - C14 Fraction	----	640 mg/kg	75.0	----	73	137	----	----	
		EP071: C15 - C28 Fraction	----	3140 mg/kg	84.8	----	53	131	----	----	
		EP071: C29 - C36 Fraction	----	2860 mg/kg	76.7	----	52	132	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3152165)</b>											
ES1324233-003	MK_SB84_0.2	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	99.2	----	73	137	----	----	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	81.9	----	53	131	----	----	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	60.8	----	52	132	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3152166)</b>											
ES1324233-003	MK_SB84_0.2	EP075(SIM): Phenol	108-95-2	10 mg/kg	88.1	----	70	130	----	----	
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	89.0	----	70	130	----	----	



Sub-Matrix: SOIL

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3152166) - continued</b>										
ES1324233-003	MK_SB84_0.2	EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	84.5	----	60	130	----	----
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	83.2	----	70	130	----	----
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	85.7	----	20	130	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3152166)</b>										
ES1324233-003	MK_SB84_0.2	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	99.4	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	106	----	70	130	----	----
<b>EG005T: Total Metals by ICP-AES (QCLot: 3155649)</b>										
ES1323683-018	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	97.0	----	70	130	----	----
		EG005T: Cadmium	7440-43-9	50 mg/kg	98.2	----	70	130	----	----
		EG005T: Chromium	7440-47-3	50 mg/kg	100	----	70	130	----	----
		EG005T: Copper	7440-50-8	125 mg/kg	101	----	70	130	----	----
		EG005T: Lead	7439-92-1	125 mg/kg	98.4	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	102	----	70	130	----	----
		EG005T: Selenium	7782-49-2	50 mg/kg	94.2	----	70	130	----	----
		EG005T: Zinc	7440-66-6	125 mg/kg	96.7	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3155650)</b>										
ES1323683-018	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	88.5	----	70	130	----	----
<b>EG005T: Total Metals by ICP-AES (QCLot: 3155651)</b>										
ES1324233-007	D01_061113_TS	EG005T: Arsenic	7440-38-2	50 mg/kg	98.7	----	70	130	----	----
		EG005T: Cadmium	7440-43-9	50 mg/kg	101	----	70	130	----	----
		EG005T: Chromium	7440-47-3	50 mg/kg	98.5	----	70	130	----	----
		EG005T: Copper	7440-50-8	125 mg/kg	103	----	70	130	----	----
		EG005T: Lead	7439-92-1	125 mg/kg	102	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	103	----	70	130	----	----
		EG005T: Selenium	7782-49-2	50 mg/kg	99.0	----	70	130	----	----
		EG005T: Zinc	7440-66-6	125 mg/kg	99.1	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3155652)</b>										
ES1324233-007	D01_061113_TS	EG035T: Mercury	7439-97-6	5 mg/kg	89.3	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3161908)</b>										
ES1324938-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	106	----	70	130	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3161908)</b>										
ES1324938-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	94.4	----	70	130	----	----
<b>EP080: BTEXN (QCLot: 3161908)</b>										
ES1324938-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	91.7	----	70	130	----	----
		EP080: Toluene	108-88-3	2.5 mg/kg	105	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	116	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	89.3	----	70	130	----	----
			106-42-3							

Page : 14 of 14  
 Work Order : ES1324233  
 Client : ENVIRO RESOURCES MANAGEMENT  
 Project : SYMPHONY-MP



Sub-Matrix: SOIL

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>EP080: BTEXN (QCLot: 3161908) - continued</b>										
ES1324938-001	Anonymous	EP080: ortho-Xylene	95-47-6	2.5 mg/kg	102	----	70	130	----	----
		EP080: Naphthalene	91-20-3	2.5 mg/kg	99.1	----	70	130	----	----

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1324233</b>	Page	: 1 of 6
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: SYMPHONY-MP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 08-NOV-2013
C-O-C number	: ----	Issue Date	: 18-NOV-2013
Sampler	: TS/GP	No. of samples received	: 17
Order number	: 0207423	No. of samples analysed	: 9
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EA055: Moisture Content</b>							
<b>Soil Glass Jar - Unpreserved (EA055-103)</b> MK_SB84_0.2, MK_SB43_0.2, D01_061113_TS, MK_SB62_0.2, MK_SB44_0.2, T01_061113_TS	06-NOV-2013	----	----	----	12-NOV-2013	20-NOV-2013	✓
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>							
<b>Snap Lock Bag (EA200)</b> MK_SB84_0.2, MK_SB43_0.2, MK_SB62_0.2, MK_SB44_0.2	06-NOV-2013	---	05-MAY-2014	----	18-NOV-2013	17-MAY-2014	✓
<b>EG005T: Total Metals by ICP-AES</b>							
<b>Soil Glass Jar - Unpreserved (EG005T)</b> MK_SB84_0.2, MK_SB43_0.2, D01_061113_TS, MK_SB62_0.2, MK_SB44_0.2, T01_061113_TS	06-NOV-2013	13-NOV-2013	05-MAY-2014	✓	14-NOV-2013	05-MAY-2014	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>							
<b>Soil Glass Jar - Unpreserved (EG035T)</b> MK_SB84_0.2, MK_SB43_0.2, D01_061113_TS, MK_SB62_0.2, MK_SB44_0.2, T01_061113_TS	06-NOV-2013	13-NOV-2013	04-DEC-2013	✓	15-NOV-2013	04-DEC-2013	✓
<b>EP080/071: Total Petroleum Hydrocarbons</b>							
<b>Soil Glass Jar - Unpreserved (EP071)</b> MK_SB84_0.2, MK_SB43_0.2, D01_061113_TS, MK_SB62_0.2, MK_SB44_0.2, T01_061113_TS	06-NOV-2013	13-NOV-2013	20-NOV-2013	✓	13-NOV-2013	23-DEC-2013	✓
<b>EP075(SIM)A: Phenolic Compounds</b>							
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MK_SB84_0.2, MK_SB43_0.2, D01_061113_TS, MK_SB62_0.2, MK_SB44_0.2, T01_061113_TS	06-NOV-2013	13-NOV-2013	20-NOV-2013	✓	13-NOV-2013	23-DEC-2013	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MK_SB84_0.2, MK_SB43_0.2, D01_061113_TS,	MK_SB62_0.2, MK_SB44_0.2, T01_061113_TS	06-NOV-2013	13-NOV-2013	20-NOV-2013	✓	13-NOV-2013	23-DEC-2013	✓
<b>EP080: BTEXN</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB84_0.2, MK_SB43_0.2, D01_061113_TS, TSC	MK_SB62_0.2, MK_SB44_0.2, T01_061113_TS,	06-NOV-2013	12-NOV-2013	20-NOV-2013	✓	13-NOV-2013	20-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> TRIP SPIKE 13,	TRIP BLANK	30-OCT-2013	15-NOV-2013	13-NOV-2013	*	15-NOV-2013	13-NOV-2013	*
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB84_0.2, MK_SB43_0.2, D01_061113_TS, TSC	MK_SB62_0.2, MK_SB44_0.2, T01_061113_TS,	06-NOV-2013	12-NOV-2013	20-NOV-2013	✓	13-NOV-2013	20-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> TRIP SPIKE 13,	TRIP BLANK	30-OCT-2013	15-NOV-2013	13-NOV-2013	*	15-NOV-2013	13-NOV-2013	*



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Moisture Content	EA055-103	4	35	11.4	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	4	32	12.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	4	40	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	3	25	12.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	32	6.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	25	8.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	32	6.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	25	8.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	32	6.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	25	8.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Asbestos Identification in bulk solids	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (2013) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of distilled water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.





## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.
- For all matrices, no Matrix Spike outliers occur.

#### Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

Matrix: SOIL

Method Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
<b>EP080/071: Total Petroleum Hydrocarbons</b>						
Soil Glass Jar - Unpreserved TRIP SPIKE 13, TRIP BLANK	15-NOV-2013	13-NOV-2013	2	15-NOV-2013	13-NOV-2013	2
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>						
Soil Glass Jar - Unpreserved TRIP SPIKE 13, TRIP BLANK	15-NOV-2013	13-NOV-2013	2	15-NOV-2013	13-NOV-2013	2
<b>EP080: BTEXN</b>						
Soil Glass Jar - Unpreserved TRIP SPIKE 13, TRIP BLANK	15-NOV-2013	13-NOV-2013	2	15-NOV-2013	13-NOV-2013	2

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

<b>Work Order</b> : <b>ES1324233</b>	
<b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : MR JONATHAN LEKAWSKI <b>Address</b> : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Laboratory</b> : Environmental Division Sydney  <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b> : jonathan.lekawski@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800	<b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555
<b>Project</b> : SYMPHONY-MP <b>Order number</b> : 0207423 <b>C-O-C number</b> : ---- <b>Site</b> : ---- <b>Sampler</b> : TS/GP	<b>Page</b> : 1 of 3  <b>Quote number</b> : ES2013ENVRES0370 (SY/278/13 V3)  <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement

#### Dates

<b>Date Samples Received</b> : 08-NOV-2013 <b>Client Requested Due Date</b> : 15-NOV-2013	<b>Issue Date</b> : 09-NOV-2013 09:33 <b>Scheduled Reporting Date</b> : <b>15-NOV-2013</b>
--	---

#### Delivery Details

<b>Mode of Delivery</b> : Carrier <b>No. of coolers/boxes</b> : 1 HARD <b>Security Seal</b> : Intact.	<b>Temperature</b> : 12.1°C - Ice present <b>No. of samples received</b> : 17 <b>No. of samples analysed</b> : 9
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#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Asbestos analysis will be conducted by ALS Newcastle.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA002 pH (1:5)	SOIL - EA200 Asbestos Identification in Soils	SOIL - ED008 Exchangeable Cations with pre-treatment -All	SOIL - S-18 (NO MOIST) TRH(C6-C9)/BTEXN with No Moisture for TBs	SOIL - S-27 TRH/BTEXN/PAH/Phenols/6Metals
ES1324233-001	30-OCT-2013 15:00	TRIP SPIKE 13					✓	
ES1324233-002	30-OCT-2013 15:00	TRIP BLANK		✓		✓	✓	
ES1324233-003	06-NOV-2013 15:00	MK_SB84_0.2			✓			✓
ES1324233-004	06-NOV-2013 15:00	MK_SB62_0.2			✓			✓
ES1324233-005	06-NOV-2013 15:00	MK_SB43_0.2			✓			✓
ES1324233-006	06-NOV-2013 15:00	MK_SB44_0.2			✓			✓
ES1324233-007	06-NOV-2013 15:00	D01_061113_TS						✓
ES1324233-008	06-NOV-2013 15:00	T01_061113_TS						✓
ES1324233-009	06-NOV-2013 15:00	MK_SB84_0.5	✓					
ES1324233-010	06-NOV-2013 15:00	MK_SB84_0.9	✓					
ES1324233-011	06-NOV-2013 15:00	MK_SB62_0.5	✓					
ES1324233-012	06-NOV-2013 15:00	MK_SB62_1.0	✓					
ES1324233-013	06-NOV-2013 15:00	MK_SB43_0.5	✓					
ES1324233-014	06-NOV-2013 15:00	MK_SB43_1.0	✓					
ES1324233-015	06-NOV-2013 15:00	MK_SB44_0.5	✓					
ES1324233-016	06-NOV-2013 15:00	MK_SB44_1.0	✓					
ES1324233-017	06-NOV-2013 15:00	TSC					✓	

## Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: **SOIL**

Evaluation: ✘ = Holding time breach ; ✓ = Within holding time.

Method		Due for extraction	Due for analysis	Samples Received		Instructions Received	
Client Sample ID(s)	Container			Date	Evaluation	Date	Evaluation
<b>EA002: pH (1:5)</b>							
TRIP BLANK	Soil Glass Jar - Unpreserved	06-NOV-2013	----	08-NOV-2013	✘	----	----



## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
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- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
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### SYMPHONY DELTAWEST

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### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

<b>Work Order</b>	<b>: ES1324233</b>		
<b>Client</b>	<b>: ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	<b>: Environmental Division Sydney</b>
<b>Contact</b>	<b>: MR JONATHAN LEKAWSKI</b>	<b>Contact</b>	<b>: Barbara Hanna</b>
<b>Address</b>	<b>: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007</b>	<b>Address</b>	<b>: 277-289 Woodpark Road Smithfield NSW Australia 2164</b>
<b>E-mail</b>	<b>: jonathan.lekawski@erm.com</b>	<b>E-mail</b>	<b>: Barbara.Hanna@alsglobal.com</b>
<b>Telephone</b>	<b>: +61 02 8584 8888</b>	<b>Telephone</b>	<b>: +61 2 8784 8555</b>
<b>Facsimile</b>	<b>: +61 02 8584 8800</b>	<b>Facsimile</b>	<b>: +61 2 8784 8555</b>
<b>Project</b>	<b>: SYMPHONY-MP</b>	<b>Page</b>	<b>: 1 of 3</b>
<b>Order number</b>	<b>: 0207423</b>	<b>Quote number</b>	<b>: ES2013ENVRES0370 (SY/278/13 V3)</b>
<b>C-O-C number</b>	<b>: ----</b>	<b>QC Level</b>	<b>: NEPM 2013 Schedule B(3) and ALS QCS3 requirement</b>
<b>Site</b>	<b>: ----</b>		
<b>Sampler</b>	<b>: TS/GP</b>		

#### Dates

<b>Date Samples Received</b>	<b>: 08-NOV-2013</b>	<b>Issue Date</b>	<b>: 12-NOV-2013 08:48</b>
<b>Client Requested Due Date</b>	<b>: 15-NOV-2013</b>	<b>Scheduled Reporting Date</b>	<b>: 15-NOV-2013</b>

#### Delivery Details

<b>Mode of Delivery</b>	<b>: Carrier</b>	<b>Temperature</b>	<b>: 12.1°C - Ice present</b>
<b>No. of coolers/boxes</b>	<b>: 1 HARD</b>	<b>No. of samples received</b>	<b>: 17</b>
<b>Security Seal</b>	<b>: Intact.</b>	<b>No. of samples analysed</b>	<b>: 9</b>

#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Asbestos analysis will be conducted by ALS Newcastle.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- No sample container / preservation non-compliance exist.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA200 Asbestos Identification in Soils	SOIL - S-18 (NO MOIST) TRH(C6-C9)/BTEXN with No Moisture for TBs	SOIL - S-27 TRH/BTEXN/PAH/Phenols/6Metals
ES1324233-001	30-OCT-2013 15:00	TRIP SPIKE 13			✓	
ES1324233-002	30-OCT-2013 15:00	TRIP BLANK			✓	
ES1324233-003	06-NOV-2013 15:00	MK_SB84_0.2		✓		✓
ES1324233-004	06-NOV-2013 15:00	MK_SB62_0.2		✓		✓
ES1324233-005	06-NOV-2013 15:00	MK_SB43_0.2		✓		✓
ES1324233-006	06-NOV-2013 15:00	MK_SB44_0.2		✓		✓
ES1324233-007	06-NOV-2013 15:00	D01_061113_TS				✓
ES1324233-008	06-NOV-2013 15:00	T01_061113_TS				✓
ES1324233-009	06-NOV-2013 15:00	MK_SB84_0.5	✓			
ES1324233-010	06-NOV-2013 15:00	MK_SB84_0.9	✓			
ES1324233-011	06-NOV-2013 15:00	MK_SB62_0.5	✓			
ES1324233-012	06-NOV-2013 15:00	MK_SB62_1.0	✓			
ES1324233-013	06-NOV-2013 15:00	MK_SB43_0.5	✓			
ES1324233-014	06-NOV-2013 15:00	MK_SB43_1.0	✓			
ES1324233-015	06-NOV-2013 15:00	MK_SB44_0.5	✓			
ES1324233-016	06-NOV-2013 15:00	MK_SB44_1.0	✓			
ES1324233-017	06-NOV-2013 15:00	TSC			✓	

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

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Email symphony.deltawest@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

DADE LANE 21 Burma Road Pootah SA 5005  
 Ph: 08 8559 0800 E: als@als.com.au  
 DERISBANE 32 Strand Street Salisbury Q1 D 4039  
 Ph: 07 3243 7232 E: samples@als.com.au  
 DULACRONE 46 Callomonda Drive Clifton Q1 D 4800  
 Ph: 07 7471 5500 E: gordon@als.com.au

DNACKY 79 Hartwood Road Mackay QLD 4740  
 Ph: 07 4044 0177 E: mackay@als.com.au  
 DNEILSON 2-4 Woodall Road Springvale VIC 3171  
 Ph: 03 8549 8000 E: samples@als.com.au  
 DUNDIDGE 37 Sydney Road Madaga NSW 2850  
 Ph: 02 6972 6735 E: madaga@als.com.au

DNEWCASTLE 8 Rose Gum Road Warneck NSW 2304  
 Ph: 02 4665 5433 E: samples@als.com.au  
 DNEWCASTLE 413 Geary Place North Hobart NSW 2541  
 Ph: 02 4423 2053 E: north@als.com.au  
 DPERTH 10 Hot Vay Madaga WA 6000  
 Ph: 08 9209 7655 E: samples@als.com.au

ESPLANCKY 277-289 Woodpark Road Smithfield NSW 2164  
 Ph: 02 8794 8555 E: samples@als.com.au  
 DTYNSVILLE 14-15 Deane Court Bohle QLD 4818  
 Ph: 07 4706 0800 E: tyndale@als.com.au

**TURAROUND REQUIREMENTS:**

Standard TAT (list due date):  Standard TAT may be longer for some tests e.g. Ultra Trace Organics  
 Non Standard or urgent TAT (list due date):

ALS QUOTE NO.: SY1728143

COC SEQUENCE NUMBER (Circle)  
 1 2 3 4 5 6 7  
 OF: 1 (2) 3 4 5 6 7

CONTACT PH: 0

RECEIVED BY: D...  
 DATE/TIME: 8/11 0830

SAMPLER MOBILE: OYSS 960 035

RELINQUISHED BY: Thavone Shaw  
 DATE/TIME: 7-11-13 / 11:00

EDD FORMAT (or default): pdf/iss/psdat

RELINQUISHED BY: Thavone Shaw  
 DATE/TIME: 7-11-13 / 11:00

EMAIL REPORTS TO (will default to PM if no other addresses are listed): Symphony.DeltaWest@erm.com

RELINQUISHED BY: Thavone Shaw  
 DATE/TIME: 7-11-13 / 11:00

EMAIL INVOICE TO (will default to PM if no other addresses are listed): Symphony.DeltaWest@erm.com

RELINQUISHED BY: Thavone Shaw  
 DATE/TIME: 7-11-13 / 11:00

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

RELINQUISHED BY: Thavone Shaw  
 DATE/TIME: 7-11-13 / 11:00

Telephone: +61-2-8784 8555



**Environmental Division**  
 Sydney  
 Work Order  
**ES1324233**

ANALYSIS USE	SAMPLE DETAILS (MATRIX/SOLID/SWATER/XY)	CONTAINER INFORMATION	ANALYSIS REQUIRED INCLUDING SUITES (NB: Suite Codes must be listed to attract suite price) (Where Metals are required, specify 'Total' (unfiltered bottle required) or 'Dissolved' (field filtered bottle required)).	Additional Information
--------------	---	-----------------------	---	------------------------

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (codes below)	(refer to)	TOTAL CONTAINERS	S-27 (8 metals- As, Cd, Cr, Cu, Ni, Pb, Zn, Hg, TRH/BTEX, PAH/Phenols)	Additional Metal - Se	TRH / BTEX / PAH / Phenol	Asbestos	VOC Scan	PCB	Particle Sizing (hydrochloric), TOC - as per NEMM10	pH, Exchangeable Cations plus ECEC	Comments on likely contaminant levels, dilutions or samples requiring specific QC analysis etc.
1	Tripsone 13	30-11-13	Soil	Jar		1								X	
2	Tip blank	↓	↓	Jar		1								X	
3	MK-SB84-0.2	06-11-13	Soil	1 jar, 1 bag / ICE		2	X	X	X	X					HOLD
⑥	MK-SB84-0.5			1 jar		1									HOLD
⑩	MK-SB84-0.9			1 jar		1									HOLD
4	MK-SB62-0.2			1 jar + 1 bag		2	X	X	X	X					HOLD
⑪	MK-SB62-0.5			1 jar		1									HOLD
⑫	MK-SB62-1.0			1 jar		1									HOLD
5	MK-SB43-0.2			1 jar + 1 bag		2	X	X	X	X					HOLD
⑬	MK-SB43-0.5			1 jar		1									HOLD
⑭	MK-SB43-1.0			1 jar + 1 bag		2	X	X	X	X					HOLD
6	MK-SB44-0.2			1 jar + 1 bag		2	X	X	X	X					HOLD
<b>TOTAL</b>															

Writer/Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORG = Nitric Preserved ORG; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic  
 V = VOA Via HCl Preserved; VA = VOA Via Sodium Bisulphate Preserved; VS = VOA Via Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formic/Dehydro Preserved Glass;  
 Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Spills; B = Unpreserved Bag.





## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>ES1324470</b> <b>Amendment</b> : <b>1</b> <b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : <b>MR JONATHAN LEKAWSKI</b> <b>Address</b> : <b>GROUND FLOOR</b> <b>33 SAUNDERS STREET, PYRMONT NSW 2009</b> <b>LOCKED BAG 24</b> <b>BROADWAY NSW, AUSTRALIA 2007</b>  <b>E-mail</b> : <b>jonathan.lekawski@erm.com</b> <b>Telephone</b> : <b>+61 02 8584 8888</b> <b>Facsimile</b> : <b>+61 02 8584 8800</b> <b>Project</b> : <b>0207423 SYMPHONY</b> <b>Order number</b> : <b>----</b> <b>C-O-C number</b> : <b>11731,11732</b> <b>Sampler</b> : <b>GP</b> <b>Site</b> : <b>MT PIPER</b>  <b>Quote number</b> : <b>SY/278/13 V3</b>	<b>Page</b> : 1 of 36  <b>Laboratory</b> : Environmental Division Sydney <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164  <b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555 <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement  <b>Date Samples Received</b> : 12-NOV-2013 <b>Issue Date</b> : 22-JAN-2014  <b>No. of samples received</b> : 40 <b>No. of samples analysed</b> : 30
--	--

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Christopher Owler	Team Leader - Asbestos	Newcastle - Asbestos
Pabi Subba	Senior Organic Chemist	Sydney Organics



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EA200 Legend**
- **EA200 'Am'** Amosite (brown asbestos)
- **EA200 'Ch'** Chrysotile (white asbestos)
- **EA200 'Cr'** Crocidolite (blue asbestos)
- **EA200 'Trace'** - Asbestos fibres detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- **EA200: 'UMF'** Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- **EA200:** Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- **EA200:** Negative results for vinyl tiles should be confirmed by an independent analytical technique.
- **EA200Q:** ALS laboratory procedures and methods used for the identification and quantitation of asbestos are consistent with AS4964-2004 and the requirements of the 2013 NEPM for Assessment of Site Contamination
- **EA200Q:** Asbestos weights and percentages are not covered under the Scope of NATA Accreditation.  
Weights of Asbestos are based on extracted bulk asbestos, fibre bundles, and/or ACM and do not include respirable fibres (if present).  
Percentages for Asbestos content in ACM are based on the 2013 NEPM default values. All numerical results under this method are approximate and should be used as a guide only.
- **EP074:** Positive result of ML\_SB26\_0.05 has been confirmed by re-analysis.
- **EP080:** The TRIP SPIKE and TRIP SPIKE CONTROL have been analysed for volatile TPH and BTEX only. The TRIP SPIKE and TRIP SPIKE CONTROL were prepared in the lab using reagent grade sand spiked with petrol. The TRIP SPIKE was dispatched from the lab and the TRIP SPIKE CONTROL retained. The spike samples were extracted and analysed concurrently with samples reported in this batch.
- This report has been amended as a result of misinterpretation of sample identification numbers (IDs). All analysis results are as per the previous report



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				MK_SB82_3.9	MK_SB81_3.0	MK_SB76_3.0	MK_SB86_1.5	MK_SB28_2.0
				06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00
				ES1324470-001	ES1324470-002	ES1324470-003	ES1324470-004	ES1324470-006
Compound	CAS Number	LOR	Unit					
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	20.5	19.9	20.8	19.9	20.8
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	11	60	11	7	26
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	11	26	12	9	46
Copper	7440-50-8	5	mg/kg	22	23	17	11	9
Lead	7439-92-1	5	mg/kg	25	23	20	17	20
Nickel	7440-02-0	2	mg/kg	20	23	34	24	55
Zinc	7440-66-6	5	mg/kg	35	53	52	35	85
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	0.1	mg/kg	----	----	<0.1	----	<0.1
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	----	----	<0.5	----	<0.5
Isopropylbenzene	98-82-8	0.5	mg/kg	----	----	<0.5	----	<0.5
n-Propylbenzene	103-65-1	0.5	mg/kg	----	----	<0.5	----	<0.5
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	----	----	<0.5	----	<0.5
sec-Butylbenzene	135-98-8	0.5	mg/kg	----	----	<0.5	----	<0.5
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	----	----	<0.5	----	<0.5
tert-Butylbenzene	98-06-6	0.5	mg/kg	----	----	<0.5	----	<0.5
p-Isopropyltoluene	99-87-6	0.5	mg/kg	----	----	<0.5	----	<0.5
n-Butylbenzene	104-51-8	0.5	mg/kg	----	----	<0.5	----	<0.5
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	----	----	<5	----	<5
2-Butanone (MEK)	78-93-3	5	mg/kg	----	----	<5	----	<5
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	----	----	<5	----	<5
2-Hexanone (MBK)	591-78-6	5	mg/kg	----	----	<5	----	<5
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	----	----	<0.5	----	<0.5
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	----	----	<0.5	----	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB82_3.9	MK_SB81_3.0	MK_SB76_3.0	MK_SB86_1.5	MK_SB28_2.0
				06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324470-001	ES1324470-002	ES1324470-003	ES1324470-004	ES1324470-006
<b>EP074D: Fumigants - Continued</b>								
1.2-Dichloropropane	78-87-5	0.5	mg/kg	----	----	<0.5	----	<0.5
cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	----	----	<0.5	----	<0.5
trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	----	----	<0.5	----	<0.5
1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	----	----	<0.5	----	<0.5
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	----	----	<5	----	<5
Chloromethane	74-87-3	5	mg/kg	----	----	<5	----	<5
Vinyl chloride	75-01-4	5	mg/kg	----	----	<5	----	<5
Bromomethane	74-83-9	5	mg/kg	----	----	<5	----	<5
Chloroethane	75-00-3	5	mg/kg	----	----	<5	----	<5
Trichlorofluoromethane	75-69-4	5	mg/kg	----	----	<5	----	<5
1.1-Dichloroethene	75-35-4	0.5	mg/kg	----	----	<0.5	----	<0.5
Iodomethane	74-88-4	0.5	mg/kg	----	----	<0.5	----	<0.5
trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	----	----	<0.5	----	<0.5
1.1-Dichloroethane	75-34-3	0.5	mg/kg	----	----	<0.5	----	<0.5
cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	----	----	<0.5	----	<0.5
1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	----	----	<0.5	----	<0.5
1.1-Dichloropropylene	563-58-6	0.5	mg/kg	----	----	<0.5	----	<0.5
Carbon Tetrachloride	56-23-5	0.5	mg/kg	----	----	<0.5	----	<0.5
1.2-Dichloroethane	107-06-2	0.5	mg/kg	----	----	<0.5	----	<0.5
Trichloroethene	79-01-6	0.5	mg/kg	----	----	<0.5	----	<0.5
Dibromomethane	74-95-3	0.5	mg/kg	----	----	<0.5	----	<0.5
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	----	----	<0.5	----	<0.5
1.3-Dichloropropane	142-28-9	0.5	mg/kg	----	----	<0.5	----	<0.5
Tetrachloroethene	127-18-4	0.5	mg/kg	----	----	<0.5	----	<0.5
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	----	----	<0.5	----	<0.5
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	----	----	<0.5	----	<0.5
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	----	----	<0.5	----	<0.5
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	----	----	<0.5	----	<0.5
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	----	----	<0.5	----	<0.5
Pentachloroethane	76-01-7	0.5	mg/kg	----	----	<0.5	----	<0.5
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	----	----	<0.5	----	<0.5
Hexachlorobutadiene	87-68-3	0.5	mg/kg	----	----	<0.5	----	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB82_3.9	MK_SB81_3.0	MK_SB76_3.0	MK_SB86_1.5	MK_SB28_2.0
				06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324470-001	ES1324470-002	ES1324470-003	ES1324470-004	ES1324470-006
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	----	----	<0.5	----	<0.5
Bromobenzene	108-86-1	0.5	mg/kg	----	----	<0.5	----	<0.5
2-Chlorotoluene	95-49-8	0.5	mg/kg	----	----	<0.5	----	<0.5
4-Chlorotoluene	106-43-4	0.5	mg/kg	----	----	<0.5	----	<0.5
1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	----	----	<0.5	----	<0.5
1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	----	----	<0.5	----	<0.5
1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	----	----	<0.5	----	<0.5
1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	----	----	<0.5	----	<0.5
1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	----	----	<0.5	----	<0.5
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	----	----	<0.5	----	<0.5
Bromodichloromethane	75-27-4	0.5	mg/kg	----	----	<0.5	----	<0.5
Dibromochloromethane	124-48-1	0.5	mg/kg	----	----	<0.5	----	<0.5
Bromoform	75-25-2	0.5	mg/kg	----	----	<0.5	----	<0.5
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB82_3.9	MK_SB81_3.0	MK_SB76_3.0	MK_SB86_1.5	MK_SB28_2.0
				06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324470-001	ES1324470-002	ES1324470-003	ES1324470-004	ES1324470-006
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB82_3.9	MK_SB81_3.0	MK_SB76_3.0	MK_SB86_1.5	MK_SB28_2.0
				06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324470-001	ES1324470-002	ES1324470-003	ES1324470-004	ES1324470-006
<b>EP080: BTEXN - Continued</b>								
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	----	----	62.8	----	62.4
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	----	102	----	99.1
Toluene-D8	2037-26-5	0.1	%	----	----	99.9	----	93.7
4-Bromofluorobenzene	460-00-4	0.1	%	----	----	96.6	----	90.0
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	86.9	90.1	84.9	82.4	87.7
2-Chlorophenol-D4	93951-73-6	0.1	%	87.9	93.2	88.3	85.8	90.9
2,4,6-Tribromophenol	118-79-6	0.1	%	74.8	76.6	73.8	71.4	72.7
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	90.7	91.0	88.0	84.7	87.0
Anthracene-d10	1719-06-8	0.1	%	78.9	84.1	80.8	79.0	81.2
4-Terphenyl-d14	1718-51-0	0.1	%	89.8	89.9	87.1	84.0	86.3
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	118	88.4	103	105	100
Toluene-D8	2037-26-5	0.1	%	115	91.8	104	97.5	97.6
4-Bromofluorobenzene	460-00-4	0.1	%	110	93.3	94.3	94.4	86.5





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				MK_SB35_3.0	MK_SB34_2.0	D_061113_01_GP	MK_SB33_1.5	MK_SB22_1.5
				06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00
				ES1324470-008	ES1324470-010	ES1324470-012	ES1324470-013	ES1324470-015
Compound	CAS Number	LOR	Unit					
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	17.4	22.6	23.4	37.1	12.9
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	18	6	6	12	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	13	7	8	50	4
Copper	7440-50-8	5	mg/kg	32	12	11	204	27
Lead	7439-92-1	5	mg/kg	32	13	14	139	26
Nickel	7440-02-0	2	mg/kg	43	29	26	9	4
Zinc	7440-66-6	5	mg/kg	92	50	32	24	47
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	----	----	----	<0.1
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	<0.5	----	----	----	<0.5
Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	----	----	----	<0.5
n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	----	----	----	<0.5
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	----	----	----	<0.5
sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	----	----	----	<0.5
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	----	----	----	<0.5
tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	----	----	----	<0.5
p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	----	----	----	<0.5
n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	----	----	----	<0.5
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	<5	----	----	----	<5
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	----	----	----	<5
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	----	----	----	<5
2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	----	----	----	<5
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	----	----	----	<0.5
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	----	----	----	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB35_3.0	MK_SB34_2.0	D_061113_01_GP	MK_SB33_1.5	MK_SB22_1.5
				06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324470-008	ES1324470-010	ES1324470-012	ES1324470-013	ES1324470-015
<b>EP074D: Fumigants - Continued</b>								
1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	----	----	----	<0.5
cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	----	----	----	<0.5
trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	----	----	----	<0.5
1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	----	----	----	<0.5
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	----	----	----	<5
Chloromethane	74-87-3	5	mg/kg	<5	----	----	----	<5
Vinyl chloride	75-01-4	5	mg/kg	<5	----	----	----	<5
Bromomethane	74-83-9	5	mg/kg	<5	----	----	----	<5
Chloroethane	75-00-3	5	mg/kg	<5	----	----	----	<5
Trichlorofluoromethane	75-69-4	5	mg/kg	<5	----	----	----	<5
1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	----	----	----	<0.5
Iodomethane	74-88-4	0.5	mg/kg	<0.5	----	----	----	<0.5
trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	----	----	----	<0.5
1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	----	----	----	<0.5
cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	----	----	----	<0.5
1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	----	----	----	<0.5
1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	----	----	----	<0.5
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	----	----	----	<0.5
1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	----	----	----	<0.5
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	----	----	----	<0.5
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	----	----	----	<0.5
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	----	----	----	<0.5
1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	----	----	----	<0.5
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	----	----	----	<0.5
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	----	----	----	<0.5
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	----	----	----	<0.5
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	----	----	----	<0.5
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	----	----	----	<0.5
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	----	----	----	<0.5
Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	----	----	----	<0.5
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	----	----	----	<0.5
Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	----	----	----	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB35_3.0	MK_SB34_2.0	D_061113_01_GP	MK_SB33_1.5	MK_SB22_1.5
				06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324470-008	ES1324470-010	ES1324470-012	ES1324470-013	ES1324470-015
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	----	----	----	<0.5
Bromobenzene	108-86-1	0.5	mg/kg	<0.5	----	----	----	<0.5
2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	----	----	----	<0.5
4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	----	----	----	<0.5
1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	----	----	----	<0.5
1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	----	----	----	<0.5
1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	----	----	----	<0.5
1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	----	----	----	<0.5
1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	----	----	----	<0.5
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	<0.5	----	----	----	<0.5
Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	----	----	----	<0.5
Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	----	----	----	<0.5
Bromoform	75-25-2	0.5	mg/kg	<0.5	----	----	----	<0.5
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<b>0.6</b>
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB35_3.0	MK_SB34_2.0	D_061113_01_GP	MK_SB33_1.5	MK_SB22_1.5
				06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324470-008	ES1324470-010	ES1324470-012	ES1324470-013	ES1324470-015
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<b>0.6</b>
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB35_3.0	MK_SB34_2.0	D_061113_01_GP	MK_SB33_1.5	MK_SB22_1.5
				06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324470-008	ES1324470-010	ES1324470-012	ES1324470-013	ES1324470-015
<b>EP080: BTEXN - Continued</b>								
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	63.8	----	----	----	63.7
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	107	----	----	----	95.6
Toluene-D8	2037-26-5	0.1	%	103	----	----	----	88.3
4-Bromofluorobenzene	460-00-4	0.1	%	97.5	----	----	----	88.9
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	83.7	90.1	94.0	89.9	82.0
2-Chlorophenol-D4	93951-73-6	0.1	%	86.9	92.4	97.8	93.2	86.6
2,4,6-Tribromophenol	118-79-6	0.1	%	71.6	76.9	81.6	76.7	69.3
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	84.3	88.8	92.4	89.8	81.5
Anthracene-d10	1719-06-8	0.1	%	79.4	81.3	84.7	83.8	74.9
4-Terphenyl-d14	1718-51-0	0.1	%	85.1	88.9	93.2	89.3	80.6
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	110	89.4	109	87.1	97.9
Toluene-D8	2037-26-5	0.1	%	107	86.2	98.8	90.0	91.7
4-Bromofluorobenzene	460-00-4	0.1	%	95.2	83.3	97.4	86.3	87.0



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB58_2.0	MK_SB40_2.0	MK_SB38_3.8	MK_SB57_3.0	ML_SB27_0.05
				07-NOV-2013 15:00	07-NOV-2013 15:00	07-NOV-2013 15:00	07-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324470-016	ES1324470-019	ES1324470-021	ES1324470-022	ES1324470-024
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	22.2	22.0	22.9	18.1	4.8
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	----	----	----	----	No
Asbestos Type	1332-21-4	-	--	----	----	----	----	-
Sample weight (dry)	----	0.01	g	----	----	----	----	96.3
APPROVED IDENTIFIER:	----	-	--	----	----	----	----	S.SPOONER
<b>EA200Q: Asbestos Quantification (non-NATA)</b>								
Weight Used for % Calculation	----	0.0001	kg	----	----	----	----	0.0963
Asbestos Containing Material	1332-21-4	0.1	g	----	----	----	----	<0.1
Fibrous Asbestos	----	0.002	g	----	----	----	----	<0.002
Asbestos Containing Material (as 15% Asbestos in ACM >7mm)	1332-21-4	0.01	%	----	----	----	----	<0.02
Asbestos Fines and Fibrous Asbestos (<7mm)	1332-21-4	0.001	%	----	----	----	----	<0.003
Trace Asbestos Detected	----	5	Fibres	----	----	----	----	No
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	20	14	<5	13	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	22	17	14	9	<2
Copper	7440-50-8	5	mg/kg	16	21	24	18	<5
Lead	7439-92-1	5	mg/kg	24	20	13	20	<5
Nickel	7440-02-0	2	mg/kg	90	59	<2	35	4
Zinc	7440-66-6	5	mg/kg	111	82	13	64	16
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	0.1	mg/kg	----	<0.1	<0.1	<0.1	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Isopropylbenzene	98-82-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
n-Propylbenzene	103-65-1	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
sec-Butylbenzene	135-98-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB58_2.0	MK_SB40_2.0	MK_SB38_3.8	MK_SB57_3.0	ML_SB27_0.05
				07-NOV-2013 15:00	07-NOV-2013 15:00	07-NOV-2013 15:00	07-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324470-016	ES1324470-019	ES1324470-021	ES1324470-022	ES1324470-024
<b>EP074A: Monocyclic Aromatic Hydrocarbons - Continued</b>								
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
tert-Butylbenzene	98-06-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
p-Isopropyltoluene	99-87-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
n-Butylbenzene	104-51-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	----	<5	<5	<5	<5
2-Butanone (MEK)	78-93-3	5	mg/kg	----	<5	<5	<5	<5
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	----	<5	<5	<5	<5
2-Hexanone (MBK)	591-78-6	5	mg/kg	----	<5	<5	<5	<5
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	78-87-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	----	<5	<5	<5	<5
Chloromethane	74-87-3	5	mg/kg	----	<5	<5	<5	<5
Vinyl chloride	75-01-4	5	mg/kg	----	<5	<5	<5	<5
Bromomethane	74-83-9	5	mg/kg	----	<5	<5	<5	<5
Chloroethane	75-00-3	5	mg/kg	----	<5	<5	<5	<5
Trichlorofluoromethane	75-69-4	5	mg/kg	----	<5	<5	<5	<5
1,1-Dichloroethene	75-35-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Iodomethane	74-88-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	75-34-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	56-23-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	107-06-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB58_2.0	MK_SB40_2.0	MK_SB38_3.8	MK_SB57_3.0	ML_SB27_0.05
				07-NOV-2013 15:00	07-NOV-2013 15:00	07-NOV-2013 15:00	07-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324470-016	ES1324470-019	ES1324470-021	ES1324470-022	ES1324470-024
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
Trichloroethene	79-01-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Dibromomethane	74-95-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
1.3-Dichloropropane	142-28-9	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	127-18-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Pentachloroethane	76-01-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Hexachlorobutadiene	87-68-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Bromobenzene	108-86-1	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
2-Chlorotoluene	95-49-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
4-Chlorotoluene	106-43-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	75-27-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	124-48-1	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Bromoform	75-25-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB58_2.0	MK_SB40_2.0	MK_SB38_3.8	MK_SB57_3.0	ML_SB27_0.05
				07-NOV-2013 15:00	07-NOV-2013 15:00	07-NOV-2013 15:00	07-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324470-016	ES1324470-019	ES1324470-021	ES1324470-022	ES1324470-024
<b>EP075(SIM)A: Phenolic Compounds - Continued</b>								
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB58_2.0	MK_SB40_2.0	MK_SB38_3.8	MK_SB57_3.0	ML_SB27_0.05
				07-NOV-2013 15:00	07-NOV-2013 15:00	07-NOV-2013 15:00	07-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324470-016	ES1324470-019	ES1324470-021	ES1324470-022	ES1324470-024
<b>EP080/071: Total Petroleum Hydrocarbons - Continued</b>								
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	----	62.2	82.4	78.1	----
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	90.6	93.6	94.8	119
Toluene-D8	2037-26-5	0.1	%	----	93.6	104	97.3	114
4-Bromofluorobenzene	460-00-4	0.1	%	----	91.4	100	92.7	109
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	87.6	83.7	89.2	84.1	83.0
2-Chlorophenol-D4	93951-73-6	0.1	%	89.4	85.4	92.3	85.6	88.6
2,4,6-Tribromophenol	118-79-6	0.1	%	76.4	74.3	73.9	75.6	72.6
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	89.9	86.6	86.9	88.5	86.4
Anthracene-d10	1719-06-8	0.1	%	83.7	81.9	77.9	82.3	79.8
4-Terphenyl-d14	1718-51-0	0.1	%	89.4	86.2	85.2	88.4	84.6



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sample ID	MK_SB58_2.0	MK_SB40_2.0	MK_SB38_3.8	MK_SB57_3.0	ML_SB27_0.05
Client sampling date / time	07-NOV-2013 15:00	07-NOV-2013 15:00	07-NOV-2013 15:00	07-NOV-2013 15:00	06-NOV-2013 15:00
Compound	ES1324470-016	ES1324470-019	ES1324470-021	ES1324470-022	ES1324470-024

Compound CAS Number LOR Unit

### EP075(SIM)T: PAH Surrogates - Continued

### EP080S: TPH(V)/BTEX Surrogates

1,2-Dichloroethane-D4	17060-07-0	0.1	%	98.9	86.3	88.8	89.4	120
Toluene-D8	2037-26-5	0.1	%	97.3	93.6	105	98.7	119
4-Bromofluorobenzene	460-00-4	0.1	%	93.2	88.2	96.5	90.6	107



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_SB26_0.05	ML_SB25_0.05	ML_SB36_0.05	ML_SB37_0.05	ML_SB28_0.05
				06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324470-025	ES1324470-026	ES1324470-027	ES1324470-028	ES1324470-029
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	21.7	8.2	10.0	8.4	10.0
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No
Asbestos Type	1332-21-4	-	--	-	-	-	-	-
Sample weight (dry)	----	0.01	g	81.8	90.8	202	119	144
APPROVED IDENTIFIER:	----	-	--	S.SPOONER	S.SPOONER	S.SPOONER	S.SPOONER	S.SPOONER
<b>EA200Q: Asbestos Quantification (non-NATA)</b>								
Weight Used for % Calculation	----	0.0001	kg	0.0818	0.0908	0.202	0.119	0.144
Asbestos Containing Material	1332-21-4	0.1	g	<0.1	<0.1	<0.1	<0.1	<0.1
Fibrous Asbestos	----	0.002	g	<0.002	<0.002	<0.002	<0.002	<0.002
Asbestos Containing Material (as 15% Asbestos in ACM >7mm)	1332-21-4	0.01	%	<0.02	<0.02	<0.01	<0.02	<0.02
Asbestos Fines and Fibrous Asbestos (<7mm)	1332-21-4	0.001	%	<0.003	<0.003	<0.001	<0.002	<0.002
Trace Asbestos Detected	----	5	Fibres	No	No	No	No	No
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	7	8	14	7	11
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	4	8	144	7	8
Copper	7440-50-8	5	mg/kg	8	18	840	16	14
Lead	7439-92-1	5	mg/kg	13	24	65	20	24
Nickel	7440-02-0	2	mg/kg	17	27	666	63	9
Zinc	7440-66-6	5	mg/kg	43	58	641	66	80
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_SB26_0.05	ML_SB25_0.05	ML_SB36_0.05	ML_SB37_0.05	ML_SB28_0.05
				06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324470-025	ES1324470-026	ES1324470-027	ES1324470-028	ES1324470-029
<b>EP074A: Monocyclic Aromatic Hydrocarbons - Continued</b>								
p-Isopropyltoluene	99-87-6	0.5	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	<5	<5	<5
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	<5	<5	<5
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	<5	<5	<5
2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	<5	<5	<5
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	<5	<5	<5
Chloromethane	74-87-3	5	mg/kg	<5	<5	<5	<5	<5
Vinyl chloride	75-01-4	5	mg/kg	<5	<5	<5	<5	<5
Bromomethane	74-83-9	5	mg/kg	<5	<5	<5	<5	<5
Chloroethane	75-00-3	5	mg/kg	<5	<5	<5	<5	<5
Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	<5	<5	<5
1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_SB26_0.05	ML_SB25_0.05	ML_SB36_0.05	ML_SB37_0.05	ML_SB28_0.05
				06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324470-025	ES1324470-026	ES1324470-027	ES1324470-028	ES1324470-029
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_SB26_0.05	ML_SB25_0.05	ML_SB36_0.05	ML_SB37_0.05	ML_SB28_0.05
				06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324470-025	ES1324470-026	ES1324470-027	ES1324470-028	ES1324470-029
<b>EP075(SIM)A: Phenolic Compounds - Continued</b>								
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	2.2
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	1.6
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	1.1
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	0.7
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	6.6
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	1.2	1.2	1.2
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	60
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	550
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	180
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	790



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_SB26_0.05	ML_SB25_0.05	ML_SB36_0.05	ML_SB37_0.05	ML_SB28_0.05
				06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00	06-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324470-025	ES1324470-026	ES1324470-027	ES1324470-028	ES1324470-029
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	110
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	630
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	740
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	110
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	101	111	107	110	99.1
Toluene-D8	2037-26-5	0.1	%	96.1	98.3	102	106	90.8
4-Bromofluorobenzene	460-00-4	0.1	%	94.0	98.3	96.0	98.8	84.7
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	85.8	89.0	93.0	90.0	84.3
2-Chlorophenol-D4	93951-73-6	0.1	%	89.8	92.7	96.1	94.1	86.6
2,4,6-Tribromophenol	118-79-6	0.1	%	77.4	77.4	81.8	72.5	70.9
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	87.9	89.5	95.5	88.1	86.7
Anthracene-d10	1719-06-8	0.1	%	81.2	81.9	89.7	81.1	95.6
4-Terphenyl-d14	1718-51-0	0.1	%	86.4	87.5	95.3	86.0	80.7
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	102	114	108	112	101
Toluene-D8	2037-26-5	0.1	%	100	102	106	110	95.2
4-Bromofluorobenzene	460-00-4	0.1	%	92.9	93.0	92.5	97.2	81.8





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_SB35_0.1	ML_SB38_0.05	MD_MW04_3.0	MK_SB13_1.6	MK_SB54_0.15
				06-NOV-2013 15:00	06-NOV-2013 15:00	07-NOV-2013 15:00	08-NOV-2013 15:00	11-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324470-030	ES1324470-031	ES1324470-033	ES1324470-034	ES1324470-035
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	2.0	19.7	20.4	12.4	9.6
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	----	----	No
Asbestos Type	1332-21-4	-	--	-	-	----	----	-
Sample weight (dry)	----	0.01	g	----	----	----	----	122
Sample weight (dry)	----	0.01	g	128	131	----	----	----
APPROVED IDENTIFIER:	----	-	--	----	----	----	----	S.SPOONER
APPROVED IDENTIFIER:	----	-	--	S.SPOONER	S.SPOONER	----	----	----
<b>EA200Q: Asbestos Quantification (non-NATA)</b>								
Weight Used for % Calculation	----	0.0001	kg	0.128	0.131	----	----	0.122
Asbestos Containing Material	1332-21-4	0.1	g	<0.1	<0.1	----	----	<0.1
Fibrous Asbestos	----	0.002	g	<0.002	<0.002	----	----	<0.002
Asbestos Containing Material (as 15% Asbestos in ACM >7mm)	1332-21-4	0.01	%	<0.02	<0.02	----	----	<0.02
Asbestos Fines and Fibrous Asbestos (<7mm)	1332-21-4	0.001	%	<0.002	<0.002	----	----	<0.002
Trace Asbestos Detected	----	5	Fibres	No	No	----	----	No
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	20	15	13	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	10	8	17	<2	13
Copper	7440-50-8	5	mg/kg	18	14	20	16	6
Lead	7439-92-1	5	mg/kg	29	23	20	14	13
Nickel	7440-02-0	2	mg/kg	110	37	42	8	9
Zinc	7440-66-6	5	mg/kg	120	72	70	40	45
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_SB35_0.1	ML_SB38_0.05	MD_MW04_3.0	MK_SB13_1.6	MK_SB54_0.15
				06-NOV-2013 15:00	06-NOV-2013 15:00	07-NOV-2013 15:00	08-NOV-2013 15:00	11-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324470-030	ES1324470-031	ES1324470-033	ES1324470-034	ES1324470-035
<b>EP074A: Monocyclic Aromatic Hydrocarbons - Continued</b>								
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	<5	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	<5	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	<5	----	----
2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	<5	----	----
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	<5	----	----
Chloromethane	74-87-3	5	mg/kg	<5	<5	<5	----	----
Vinyl chloride	75-01-4	5	mg/kg	<5	<5	<5	----	----
Bromomethane	74-83-9	5	mg/kg	<5	<5	<5	----	----
Chloroethane	75-00-3	5	mg/kg	<5	<5	<5	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	<5	----	----
1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_SB35_0.1	ML_SB38_0.05	MD_MW04_3.0	MK_SB13_1.6	MK_SB54_0.15
				06-NOV-2013 15:00	06-NOV-2013 15:00	07-NOV-2013 15:00	08-NOV-2013 15:00	11-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324470-030	ES1324470-031	ES1324470-033	ES1324470-034	ES1324470-035
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_SB35_0.1	ML_SB38_0.05	MD_MW04_3.0	MK_SB13_1.6	MK_SB54_0.15
				06-NOV-2013 15:00	06-NOV-2013 15:00	07-NOV-2013 15:00	08-NOV-2013 15:00	11-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324470-030	ES1324470-031	ES1324470-033	ES1324470-034	ES1324470-035
<b>EP075(SIM)A: Phenolic Compounds - Continued</b>								
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<b>0.8</b>	<0.5	<0.5	<b>0.9</b>	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<b>0.8</b>	<0.5	<0.5	<b>0.9</b>	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<b>110</b>	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_SB35_0.1	ML_SB38_0.05	MD_MW04_3.0	MK_SB13_1.6	MK_SB54_0.15
				06-NOV-2013 15:00	06-NOV-2013 15:00	07-NOV-2013 15:00	08-NOV-2013 15:00	11-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324470-030	ES1324470-031	ES1324470-033	ES1324470-034	ES1324470-035
<b>EP080/071: Total Petroleum Hydrocarbons - Continued</b>								
^ C10 - C36 Fraction (sum)	----	50	mg/kg	110	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	130	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	130	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	101	107	99.8	----	----
Toluene-D8	2037-26-5	0.1	%	89.1	103	101	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	84.6	98.3	100	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	108	108	107	104	106
2-Chlorophenol-D4	93951-73-6	0.1	%	110	106	110	102	111
2,4,6-Tribromophenol	118-79-6	0.1	%	67.1	69.1	63.4	65.1	62.9
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	94.6	97.9	93.7	93.6	93.7
Anthracene-d10	1719-06-8	0.1	%	79.2	84.7	81.8	80.3	82.2
4-Terphenyl-d14	1718-51-0	0.1	%	74.8	79.0	76.6	75.6	76.1
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	103	108	94.9	116	100



### Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_SB35_0.1	ML_SB38_0.05	MD_MW04_3.0	MK_SB13_1.6	MK_SB54_0.15
				06-NOV-2013 15:00	06-NOV-2013 15:00	07-NOV-2013 15:00	08-NOV-2013 15:00	11-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324470-030	ES1324470-031	ES1324470-033	ES1324470-034	ES1324470-035
<b>EP080S: TPH(V)/BTEX Surrogates - Continued</b>								
Toluene-D8	2037-26-5	0.1	%	92.8	108	102	111	108
4-Bromofluorobenzene	460-00-4	0.1	%	80.3	96.4	96.9	105	101



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				MK_SB54_1.0	D_111113_01_GP	TRIP BLANK	TRIP SPIKE	TSC
				11-NOV-2013 15:00	11-NOV-2013 15:00	04-NOV-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00
				ES1324470-036	ES1324470-037	ES1324470-038	ES1324470-039	ES1324470-040
Compound	CAS Number	LOR	Unit	Client sampling date / time				
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	18.5	14.8	----	----	----
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	----	----	----
Arsenic	7440-38-2	5	mg/kg	<5	<5	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	4	6	----	----	----
Copper	7440-50-8	5	mg/kg	<5	8	----	----	----
Lead	7439-92-1	5	mg/kg	10	11	----	----	----
Nickel	7440-02-0	2	mg/kg	<2	<2	----	----	----
Zinc	7440-66-6	5	mg/kg	7	8	----	----	----
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	----	----
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	----	----	----	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	<0.5	----	----	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	----	----	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	----	----	----	----
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	----	----	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	----	----	----	----
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	----	----	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	----	----	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	----	----	----	----
n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	----	----	----	----
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	<5	----	----	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	----	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	----	----	----	----
2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	----	----	----	----
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	----	----	----	----
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	----	----	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB54_1.0	D_111113_01_GP	TRIP BLANK	TRIP SPIKE	TSC
				11-NOV-2013 15:00	11-NOV-2013 15:00	04-NOV-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324470-036	ES1324470-037	ES1324470-038	ES1324470-039	ES1324470-040
<b>EP074D: Fumigants - Continued</b>								
1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	----	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	----	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	----	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	----	----	----	----
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	----	----	----	----
Chloromethane	74-87-3	5	mg/kg	<5	----	----	----	----
Vinyl chloride	75-01-4	5	mg/kg	<5	----	----	----	----
Bromomethane	74-83-9	5	mg/kg	<5	----	----	----	----
Chloroethane	75-00-3	5	mg/kg	<5	----	----	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg	<5	----	----	----	----
1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	----	----	----	----
Iodomethane	74-88-4	0.5	mg/kg	<0.5	----	----	----	----
trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	----	----	----	----
1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	----	----	----	----
1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	----	----	----	----
1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	----	----	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	----	----	----	----
1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	----	----	----	----
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	----	----	----	----
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	----	----	----	----
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	----	----	----	----
1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	----	----	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	----	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	----	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	----	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	----	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	----	----	----	----
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	----	----	----	----
Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	----	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	----	----	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	----	----	----	----





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB54_1.0	D_111113_01_GP	TRIP BLANK	TRIP SPIKE	TSC
				11-NOV-2013 15:00	11-NOV-2013 15:00	04-NOV-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324470-036	ES1324470-037	ES1324470-038	ES1324470-039	ES1324470-040
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	----	----	----	----
Bromobenzene	108-86-1	0.5	mg/kg	<0.5	----	----	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	----	----	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	----	----	----	----
1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	----	----	----	----
1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	----	----	----	----
1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	----	----	----	----
1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	----	----	----	----
1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	----	----	----	----
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	<0.5	----	----	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	----	----	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	----	----	----	----
Bromoform	75-25-2	0.5	mg/kg	<0.5	----	----	----	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	----	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	----	----	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	----	----	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	----	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	----	----	----
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	----	----	----
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	----	----	----
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	----	----	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	----	----	----
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	----	----	----
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	----	----	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	----	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	----	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB54_1.0	D_111113_01_GP	TRIP BLANK	TRIP SPIKE	TSC
				11-NOV-2013 15:00	11-NOV-2013 15:00	04-NOV-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324470-036	ES1324470-037	ES1324470-038	ES1324470-039	ES1324470-040
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	----	----	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	----	----	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<b>25</b>	<b>81</b>
C10 - C14 Fraction	----	50	mg/kg	<50	<50	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	----	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<b>28</b>	<b>90</b>
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<b>14</b>	<b>58</b>
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	----	----	----
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<b>0.3</b>	<b>0.7</b>
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<b>7.5</b>	<b>15.7</b>



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				MK_SB54_1.0	D_111113_01_GP	TRIP BLANK	TRIP SPIKE	TSC
				11-NOV-2013 15:00	11-NOV-2013 15:00	04-NOV-2013 15:00	30-OCT-2013 15:00	30-OCT-2013 15:00
				ES1324470-036	ES1324470-037	ES1324470-038	ES1324470-039	ES1324470-040
Compound	CAS Number	LOR	Unit					
<b>EP080: BTEXN - Continued</b>								
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	0.7	2.1
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	4.0	10.0
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	1.6	3.9
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	14.1	32.4
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	5.6	13.9
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	64.1	----	----	----	----
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	103	----	----	----	----
Toluene-D8	2037-26-5	0.1	%	101	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	101	----	----	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	107	109	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	104	106	----	----	----
2,4,6-Tribromophenol	118-79-6	0.1	%	63.5	64.4	----	----	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	93.0	97.2	----	----	----
Anthracene-d10	1719-06-8	0.1	%	80.1	83.2	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	75.8	79.2	----	----	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	109	100	92.5	111	102
Toluene-D8	2037-26-5	0.1	%	93.4	106	88.4	90.9	112
4-Bromofluorobenzene	460-00-4	0.1	%	101	96.9	82.5	96.2	105



## Analytical Results

### Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>		
EA200: Description	MK_SB54_0.15 - 11-NOV-2013 15:00	Mid yellow - brown clay soil with plenty of white quartz grains plus a trace of vegetation.
EA200: Description	ML_SB27_0.05 - 06-NOV-2013 15:00	Mid grey - brown clay soil with dark grey and orange rocks plus some quartz grains with a trace of vegetation.
EA200: Description	ML_SB26_0.05 - 06-NOV-2013 15:00	Mid grey - brown clay soil with dark grey and orange rocks plus some quartz grains with a trace of vegetation.
EA200: Description	ML_SB25_0.05 - 06-NOV-2013 15:00	Mid brown clay soil with dark grey and orange rocks plus some quartz grains with a trace of vegetation.
EA200: Description	ML_SB36_0.05 - 06-NOV-2013 15:00	Pale red sandy soil with grey and red rocks plus a trace of vegetation.
EA200: Description	ML_SB37_0.05 - 06-NOV-2013 15:00	Mid grey soil with grey and dark red rocks plus a trace of vegetation.
EA200: Description	ML_SB28_0.05 - 06-NOV-2013 15:00	Mid grey soil with dark grey and orange rocks plus some quartz grains with a trace of vegetation.
EA200: Description	ML_SB35_0.1 - 06-NOV-2013 15:00	Mid grey soil with grey rocks plus a trace of vegetation.
EA200: Description	ML_SB38_0.05 - 06-NOV-2013 15:00	Mid brown clay soil with grey and orange rocks plus some vegetation.



## Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP066S: PCB Surrogate</b>			
Decachlorobiphenyl	2051-24-3	39	149
<b>EP074S: VOC Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	64	130
Toluene-D8	2037-26-5	66	136
4-Bromofluorobenzene	460-00-4	60	122
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

## QUALITY CONTROL REPORT

<b>Work Order</b>	: <b>ES1324470</b>	<b>Page</b>	: 1 of 25
<b>Amendment</b>	: <b>1</b>		
<b>Client</b>	: <b>ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: MR JONATHAN LEKAWSKI	<b>Contact</b>	: Barbara Hanna
<b>Address</b>	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
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<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: 0207423 SYMPHONY	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b>	: MT PIPER		
<b>C-O-C number</b>	: 11731,11732	<b>Date Samples Received</b>	: 12-NOV-2013
<b>Sampler</b>	: GP	<b>Issue Date</b>	: 22-JAN-2014
<b>Order number</b>	: ----		
<b>Quote number</b>	: SY/278/13 V3	<b>No. of samples received</b>	: 40
		<b>No. of samples analysed</b>	: 30

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Christopher Owlser	Team Leader - Asbestos	Newcastle - Asbestos
Pabi Subba	Senior Organic Chemist	Sydney Organics



### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :  
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
RPD = Relative Percentage Difference  
# = Indicates failed QC



### Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EA055: Moisture Content (QC Lot: 3156931)</b>									
ES1324451-009	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	2.1	2.4	12.4	No Limit
ES1324451-020	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	3.6	4.0	8.6	No Limit
<b>EA055: Moisture Content (QC Lot: 3156932)</b>									
ES1324470-013	MK_SB33_1.5	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	37.1	36.5	1.6	0% - 20%
ES1324470-029	ML_SB28_0.05	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	10.0	9.0	10.7	0% - 50%
<b>EA055: Moisture Content (QC Lot: 3156933)</b>									
ES1324476-003	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	6.5	6.0	9.5	No Limit
ES1324476-023	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	1.0	<1.0	0.0	No Limit
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3158836)</b>									
ES1324374-031	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	10	9	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	11	10	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	20	18	9.1	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	16	14	10.4	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	54	51	5.4	0% - 50%
ES1324470-025	ML_SB26_0.05	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	4	4	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	17	16	7.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	7	<5	31.8	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	8	9	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	13	12	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	43	36	17.7	No Limit
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3158839)</b>									
ES1324470-036	MK_SB54_1.0	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	4	5	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	10	9	12.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	7	6	19.9	No Limit
ES1324590-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit





Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3158839) - continued</b>									
ES1324590-001	Anonymous	EG005T: Chromium	7440-47-3	2	mg/kg	19	21	12.4	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	19	20	6.4	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	7	8	14.5	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	31	36	14.4	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	29	36	21.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	288	326	12.3	0% - 20%
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3161227)</b>									
ES1324470-001	MK_SB82_3.9	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	11	12	11.5	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	20	21	4.9	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	11	9	15.3	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	22	21	8.6	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	25	22	9.4	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	35	39	8.8	No Limit
ES1324470-016	MK_SB58_2.0	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	22	25	10.6	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	90	78	13.4	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	20	20	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	16	16	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	24	22	5.4	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	111	96	14.2	0% - 20%
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3158837)</b>									
ES1324374-031	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1324470-025	ML_SB26_0.05	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3158840)</b>									
ES1324470-036	MK_SB54_1.0	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1324590-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3161228)</b>									
ES1324470-001	MK_SB82_3.9	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1324470-016	MK_SB58_2.0	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 3156180)</b>									
ES1324476-007	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1324470-019	MK_SB40_2.0	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3155844)</b>									
ES1324470-003	MK_SB76_3.0	EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3155844) - continued</b>									
ES1324470-003	MK_SB76_3.0	EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1324470-027	ML_SB36_0.05	EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
<b>EP074B: Oxygenated Compounds (QC Lot: 3155844)</b>									
ES1324470-003	MK_SB76_3.0	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.0	No Limit
ES1324470-027	ML_SB36_0.05	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.0	No Limit
<b>EP074C: Sulfonated Compounds (QC Lot: 3155844)</b>									
ES1324470-003	MK_SB76_3.0	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1324470-027	ML_SB36_0.05	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074D: Fumigants (QC Lot: 3155844)</b>									
ES1324470-003	MK_SB76_3.0	EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1324470-027	ML_SB36_0.05	EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3155844)</b>									



Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3155844) - continued</b>									
ES1324470-003	MK_SB76_3.0	EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.0	No Limit
EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.0	No Limit		
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.0	No Limit		
ES1324470-027	ML_SB36_0.05	EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3155844) - continued</b>									
ES1324470-027	ML_SB36_0.05	EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.0	No Limit
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.0	No Limit		
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3155844)</b>									
ES1324470-003	MK_SB76_3.0	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1324470-027	ML_SB36_0.05	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074G: Trihalomethanes (QC Lot: 3155844)</b>									
ES1324470-003	MK_SB76_3.0	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1324470-027	ML_SB36_0.05	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074G: Trihalomethanes (QC Lot: 3155844) - continued</b>									
ES1324470-027	ML_SB36_0.05	EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3155799)</b>									
ES1324470-001	MK_SB82_3.9	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
ES1324470-016	MK_SB58_2.0	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3155826)</b>									
ES1324458-001	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3155826) - continued</b>									
ES1324458-001	Anonymous	EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
ES1324470-031	ML_SB38_0.05	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
		<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3155799)</b>							
ES1324470-001	MK_SB82_3.9	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1324470-016	MK_SB58_2.0	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit





Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3155799) - continued</b>									
ES1324470-016	MK_SB58_2.0	EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	0.5	0.0	No Limit
EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3155826)</b>									
ES1324458-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
ES1324470-031	ML_SB38_0.05	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3155826) - continued</b>									
ES1324470-031	ML_SB38_0.05	EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3155798)</b>									
ES1324470-001	MK_SB82_3.9	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1324470-016	MK_SB58_2.0	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3155825)</b>									
ES1324458-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1324470-031	ML_SB38_0.05	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3155843)</b>									
ES1324470-003	MK_SB76_3.0	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1324470-027	ML_SB36_0.05	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3160436)</b>									
ES1324470-001	MK_SB82_3.9	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1324470-037	D_111113_01_GP	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3155798)</b>									
ES1324470-001	MK_SB82_3.9	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
ES1324470-016	MK_SB58_2.0	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3155825)</b>									





Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3155825) - continued</b>									
ES1324458-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
ES1324470-031	ML_SB38_0.05	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3155843)</b>									
ES1324470-003	MK_SB76_3.0	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES1324470-027	ML_SB36_0.05	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3160436)</b>									
ES1324470-001	MK_SB82_3.9	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES1324470-037	D_111113_01_GP	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3155843)</b>									
ES1324470-003	MK_SB76_3.0	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES1324470-027	ML_SB36_0.05	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3160436)</b>									
ES1324470-001	MK_SB82_3.9	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES1324470-037	D_111113_01_GP	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

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 Work Order : ES1324470 Amendment 1  
 Client : ENVIRO RESOURCES MANAGEMENT  
 Project : 0207423 SYMPHONY



Sub-Matrix: <b>SOIL</b>				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP080: BTEXN (QC Lot: 3160436) - continued</b>									
ES1324470-037	D_111113_01_GP	EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit



### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3158836)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	102	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	96.8	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	105	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	108	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	98.4	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	107	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	99.6	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	94.8	81	133	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3158839)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	109	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	104	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	108	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	108	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	104	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	114	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	108	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	107	81	133	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3161227)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	112	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	104	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	124	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	109	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	105	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	116	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	106	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	109	81	133	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3158837)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	84.6	66	112	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3158840)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	79.7	66	112	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3161228)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	81.3	66	112	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3156180)</b>									
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	99.4	57.4	117	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3155844)</b>									
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	96.6	64	126	
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	94.9	66	128	
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	88.2	63	129	
EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	90.8	63	129	
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	90.7	64	130	
EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	90.9	63	129	
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	88.5	63	129	
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	90.8	62	130	
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	89.4	61	131	
<b>EP074B: Oxygenated Compounds (QCLot: 3155844)</b>									
EP074: Vinyl Acetate	108-05-4	1	mg/kg	----	10 mg/kg	31.8	29.6	156	
		5	mg/kg	<5	----	----	----	----	
EP074: 2-Butanone (MEK)	78-93-3	1	mg/kg	----	10 mg/kg	131	58	136	
		5	mg/kg	<5	----	----	----	----	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	1	mg/kg	----	10 mg/kg	87.2	54	138	
		5	mg/kg	<5	----	----	----	----	
EP074: 2-Hexanone (MBK)	591-78-6	1	mg/kg	----	10 mg/kg	104	54	136	
		5	mg/kg	<5	----	----	----	----	
<b>EP074C: Sulfonated Compounds (QCLot: 3155844)</b>									
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	75.3	54	126	
<b>EP074D: Fumigants (QCLot: 3155844)</b>									
EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	86.3	55	133	
EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	98.7	69	127	
EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	88.1	54	124	
EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	85.8	51	125	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	101	66	126	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3155844)</b>									
EP074: Dichlorodifluoromethane	75-71-8	1	mg/kg	----	10 mg/kg	44.2	30	148	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloromethane	74-87-3	1	mg/kg	----	10 mg/kg	55.9	41	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Vinyl chloride	75-01-4	1	mg/kg	----	10 mg/kg	96.0	43	147	
		5	mg/kg	<5	----	----	----	----	
EP074: Bromomethane	74-83-9	1	mg/kg	----	10 mg/kg	73.3	47	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloroethane	75-00-3	1	mg/kg	----	10 mg/kg	84.1	49	143	
		5	mg/kg	<5	----	----	----	----	
EP074: Trichlorofluoromethane	75-69-4	1	mg/kg	----	10 mg/kg	87.7	49	135	
		5	mg/kg	<5	----	----	----	----	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3155844) - continued</b>									
EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	84.4	54	126	
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	82.2	43	129	
EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	91.1	62	130	
EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	102	66	132	
EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	101	66	132	
EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	93.5	62	126	
EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	95.9	64	128	
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	102	59	125	
EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	113	65	123	
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	102	64	120	
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	106	65	127	
EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	102	70	130	
EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	101	72	128	
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	101	67	143	
EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	97.3	62	122	
EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	89.0	54	128	
EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	89.4	55	129	
EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	102	56	132	
EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	104	65	135	
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	88.8	19.8	134	
EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	93.9	53	129	
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	98.0	48	136	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3155844)</b>									
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	100	70	128	
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	93.6	67	127	
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	92.1	64	130	
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	91.9	62	130	
EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	96.5	63	129	
EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	94.1	63	129	
EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	101	66	128	
EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	89.5	54	134	
EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	107	60	132	
<b>EP074G: Trihalomethanes (QCLot: 3155844)</b>									
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	104	62	120	
EP074: Dibromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	102	61	121	
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	107	63	121	
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	110	60	126	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3155799)</b>									
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	96.5	74	116	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3155799) - continued</b>									
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	92.7	74	116	
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	108	72	116	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	107	69	123	
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	89.2	60.3	117	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	88.4	69	117	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	84.7	68	112	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	87.8	73	117	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	91.1	76.4	114	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	77.5	57	111	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	74.3	68.9	112	
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	21.4	3.9	57	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3155826)</b>									
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	96.6	74	116	
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	88.1	74	116	
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	87.6	72	116	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	96.9	69	123	
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	82.1	60.3	117	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	97.0	69	117	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	83.5	68	112	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	85.7	73	117	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	83.0	76.4	114	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	92.6	57	111	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	85.6	68.9	112	
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	19.8	3.9	57	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3155799)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	89.4	80	124	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	94.2	77	123	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	93.0	79	123	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	97.8	77	123	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	98.2	79	123	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	98.0	79	123	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	98.8	79	123	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	100	79	125	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	93.2	73	121	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	96.7	81	123	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	92.7	70	118	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	96.9	77	123	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	90.2	76	122	
EP075(SIM): Indeno(1,2,3-cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	86.4	71	113	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3155799) - continued</b>									
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	84.3	71.7	113	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	87.6	72.4	114	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3155826)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	112	80	124	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	101	77	123	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	108	79	123	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	109	77	123	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	110	79	123	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	109	79	123	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	109	79	123	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	113	79	125	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	88.7	73	121	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	103	81	123	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	81.8	70	118	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	103	77	123	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	104	76	122	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	93.6	71	113	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	93.0	71.7	113	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	84.5	72.4	114	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3155798)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	84.6	71	131	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	89.4	74	138	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	95.9	64	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3155825)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	107	71	131	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	115	74	138	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	104	64	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3155843)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	97.3	68.4	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3160436)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	121	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3155798)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	84.9	70	130	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	94.0	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	
		50	mg/kg	----	150 mg/kg	85.9	63	131	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3155825)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	101	70	130	





Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3155825) - continued</b>									
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	116	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	
		50	mg/kg	----	150 mg/kg	101	63	131	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3155843)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	96.0	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3160436)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	125	68.4	128	
<b>EP080: BTEXN (QCLot: 3155843)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	98.0	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	99.3	62	128	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	93.8	58	118	
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	95.9	60	120	
	106-42-3								
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	97.0	60	120	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	95.5	62	138	
<b>EP080: BTEXN (QCLot: 3160436)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	116	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	104	62	128	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	105	58	118	
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	105	60	120	
	106-42-3								
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	104	60	120	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	98.2	62	138	

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report				
				Spike Concentration	Spike Recovery(%)		Recovery Limits (%)	
					MS	Low	High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3158836)</b>								
ES1324374-031	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	101	70	130	
		EG005T: Cadmium	7440-43-9	50 mg/kg	92.8	70	130	
		EG005T: Chromium	7440-47-3	50 mg/kg	97.4	70	130	
		EG005T: Copper	7440-50-8	125 mg/kg	112	70	130	
		EG005T: Lead	7439-92-1	125 mg/kg	93.4	70	130	
		EG005T: Nickel	7440-02-0	50 mg/kg	95.5	70	130	





Sub-Matrix: SOIL

				Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EG005T: Total Metals by ICP-AES (QCLot: 3158836) - continued</b>							
ES1324374-031	Anonymous	EG005T: Selenium	7782-49-2	50 mg/kg	98.2	70	130
		EG005T: Zinc	7440-66-6	125 mg/kg	84.0	70	130
<b>EG005T: Total Metals by ICP-AES (QCLot: 3158839)</b>							
ES1324470-036	MK_SB54_1.0	EG005T: Arsenic	7440-38-2	50 mg/kg	102	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	105	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	106	70	130
		EG005T: Copper	7440-50-8	125 mg/kg	100	70	130
		EG005T: Lead	7439-92-1	125 mg/kg	108	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	108	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	99.5	70	130
		EG005T: Zinc	7440-66-6	125 mg/kg	101	70	130
<b>EG005T: Total Metals by ICP-AES (QCLot: 3161227)</b>							
ES1324470-001	MK_SB82_3.9	EG005T: Arsenic	7440-38-2	50 mg/kg	113	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	107	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	114	70	130
		EG005T: Copper	7440-50-8	125 mg/kg	112	70	130
		EG005T: Lead	7439-92-1	125 mg/kg	110	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	109	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	105	70	130
		EG005T: Zinc	7440-66-6	125 mg/kg	104	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3158837)</b>							
ES1324374-031	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	97.6	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3158840)</b>							
ES1324470-036	MK_SB54_1.0	EG035T: Mercury	7439-97-6	5 mg/kg	93.0	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3161228)</b>							
ES1324470-001	MK_SB82_3.9	EG035T: Mercury	7439-97-6	5 mg/kg	104	70	130
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3156180)</b>							
ES1324476-007	Anonymous	EP066: Total Polychlorinated biphenyls	---	1 mg/kg	110	70	130
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3155844)</b>							
ES1324470-003	MK_SB76_3.0	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	92.8	70	130
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	93.1	70	130
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3155844)</b>							
ES1324470-003	MK_SB76_3.0	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	93.1	70	130
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3155799)</b>							
ES1324470-001	MK_SB82_3.9	EP075(SIM): Phenol	108-95-2	10 mg/kg	89.7	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	89.8	70	130



Sub-Matrix: SOIL

				Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3155799) - continued</b>							
ES1324470-001	MK_SB82_3.9	EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	80.4	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	91.6	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	58.3	20	130
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3155826)</b>							
ES1324458-001	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	98.6	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	97.4	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	75.7	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	73.9	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	53.6	20	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3155799)</b>							
ES1324470-001	MK_SB82_3.9	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	89.9	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	95.6	70	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3155826)</b>							
ES1324458-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	94.6	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	110	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3155798)</b>							
ES1324470-001	MK_SB82_3.9	EP071: C10 - C14 Fraction	----	640 mg/kg	80.8	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	88.7	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	84.9	52	132
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3155825)</b>							
ES1324458-001	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	77.0	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	79.8	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	64.7	52	132
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3155843)</b>							
ES1324470-003	MK_SB76_3.0	EP080: C6 - C9 Fraction	----	32.5 mg/kg	76.2	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3160436)</b>							
ES1324470-001	MK_SB82_3.9	EP080: C6 - C9 Fraction	----	32.5 mg/kg	120	70	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3155798)</b>							
ES1324470-001	MK_SB82_3.9	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	107	73	137
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	87.5	53	131
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	67.5	52	132
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3155825)</b>							
ES1324458-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	98.0	73	137
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	71.2	53	131
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	54.0	52	132
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3155843)</b>							



Sub-Matrix: SOIL

				Matrix Spike (MS) Report				
				Spike	Spike Recovery(%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3155843) - continued</b>								
ES1324470-003	MK_SB76_3.0	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	75.1	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3160436)</b>								
ES1324470-001	MK_SB82_3.9	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	121	70	130	
<b>EP080: BTEXN (QCLot: 3155843)</b>								
ES1324470-003	MK_SB76_3.0	EP080: Benzene	71-43-2	2.5 mg/kg	72.4	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	72.5	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	74.6	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	73.3	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	76.5	70	130	
	EP080: Naphthalene	91-20-3	2.5 mg/kg	74.7	70	130		
<b>EP080: BTEXN (QCLot: 3160436)</b>								
ES1324470-001	MK_SB82_3.9	EP080: Benzene	71-43-2	2.5 mg/kg	105	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	102	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	106	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	106	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	104	70	130	
	EP080: Naphthalene	91-20-3	2.5 mg/kg	80.8	70	130		

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3155798)</b>										
ES1324470-001	MK_SB82_3.9	EP071: C10 - C14 Fraction	----	640 mg/kg	80.8	----	73	137	----	----
		EP071: C15 - C28 Fraction	----	3140 mg/kg	88.7	----	53	131	----	----
		EP071: C29 - C36 Fraction	----	2860 mg/kg	84.9	----	52	132	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3155798)</b>										
ES1324470-001	MK_SB82_3.9	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	107	----	73	137	----	----
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	87.5	----	53	131	----	----
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	67.5	----	52	132	----	----
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3155799)</b>										
ES1324470-001	MK_SB82_3.9	EP075(SIM): Phenol	108-95-2	10 mg/kg	89.7	----	70	130	----	----
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	89.8	----	70	130	----	----



Sub-Matrix: SOIL

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3155799) - continued</b>										
ES1324470-001	MK_SB82_3.9	EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	80.4	----	60	130	----	----
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	91.6	----	70	130	----	----
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	58.3	----	20	130	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3155799)</b>										
ES1324470-001	MK_SB82_3.9	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	89.9	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	95.6	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3155825)</b>										
ES1324458-001	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	77.0	----	73	137	----	----
		EP071: C15 - C28 Fraction	----	3140 mg/kg	79.8	----	53	131	----	----
		EP071: C29 - C36 Fraction	----	2860 mg/kg	64.7	----	52	132	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3155825)</b>										
ES1324458-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	98.0	----	73	137	----	----
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	71.2	----	53	131	----	----
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	54.0	----	52	132	----	----
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3155826)</b>										
ES1324458-001	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	98.6	----	70	130	----	----
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	97.4	----	70	130	----	----
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	75.7	----	60	130	----	----
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	73.9	----	70	130	----	----
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	53.6	----	20	130	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3155826)</b>										
ES1324458-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	94.6	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	110	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3155843)</b>										
ES1324470-003	MK_SB76_3.0	EP080: C6 - C9 Fraction	----	32.5 mg/kg	76.2	----	70	130	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3155843)</b>										
ES1324470-003	MK_SB76_3.0	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	75.1	----	70	130	----	----
<b>EP080: BTEXN (QCLot: 3155843)</b>										
ES1324470-003	MK_SB76_3.0	EP080: Benzene	71-43-2	2.5 mg/kg	72.4	----	70	130	----	----
		EP080: Toluene	108-88-3	2.5 mg/kg	72.5	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	74.6	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	73.3	----	70	130	----	----
		EP080: ortho-Xylene	106-42-3	2.5 mg/kg	76.5	----	70	130	----	----
		EP080: Naphthalene	91-20-3	2.5 mg/kg	74.7	----	70	130	----	----
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3155844)</b>										
ES1324470-003	MK_SB76_3.0	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	92.8	----	70	130	----	----



Sub-Matrix: SOIL					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
						MS	MSD	Low	High	Value	Control Limit
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number								
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3155844) - continued</b>											
ES1324470-003	MK_SB76_3.0	EP074: Trichloroethene	79-01-6	2.5 mg/kg	93.1	----	70	130	----	----	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3155844)</b>											
ES1324470-003	MK_SB76_3.0	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	93.1	----	70	130	----	----	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3156180)</b>											
ES1324476-007	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	110	----	70	130	----	----	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3158836)</b>											
ES1324374-031	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	101	----	70	130	----	----	
		EG005T: Cadmium	7440-43-9	50 mg/kg	92.8	----	70	130	----	----	
		EG005T: Chromium	7440-47-3	50 mg/kg	97.4	----	70	130	----	----	
		EG005T: Copper	7440-50-8	125 mg/kg	112	----	70	130	----	----	
		EG005T: Lead	7439-92-1	125 mg/kg	93.4	----	70	130	----	----	
		EG005T: Nickel	7440-02-0	50 mg/kg	95.5	----	70	130	----	----	
		EG005T: Selenium	7782-49-2	50 mg/kg	98.2	----	70	130	----	----	
EG005T: Zinc	7440-66-6	125 mg/kg	84.0	----	70	130	----	----			
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3158837)</b>											
ES1324374-031	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	97.6	----	70	130	----	----	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3158839)</b>											
ES1324470-036	MK_SB54_1.0	EG005T: Arsenic	7440-38-2	50 mg/kg	102	----	70	130	----	----	
		EG005T: Cadmium	7440-43-9	50 mg/kg	105	----	70	130	----	----	
		EG005T: Chromium	7440-47-3	50 mg/kg	106	----	70	130	----	----	
		EG005T: Copper	7440-50-8	125 mg/kg	100	----	70	130	----	----	
		EG005T: Lead	7439-92-1	125 mg/kg	108	----	70	130	----	----	
		EG005T: Nickel	7440-02-0	50 mg/kg	108	----	70	130	----	----	
		EG005T: Selenium	7782-49-2	50 mg/kg	99.5	----	70	130	----	----	
		EG005T: Zinc	7440-66-6	125 mg/kg	101	----	70	130	----	----	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3158840)</b>											
ES1324470-036	MK_SB54_1.0	EG035T: Mercury	7439-97-6	5 mg/kg	93.0	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3160436)</b>											
ES1324470-001	MK_SB82_3.9	EP080: C6 - C9 Fraction	----	32.5 mg/kg	120	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3160436)</b>											
ES1324470-001	MK_SB82_3.9	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	121	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3160436)</b>											
ES1324470-001	MK_SB82_3.9	EP080: Benzene	71-43-2	2.5 mg/kg	105	----	70	130	----	----	
		EP080: Toluene	108-88-3	2.5 mg/kg	102	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	106	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	106	----	70	130	----	----	

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 Work Order : ES1324470 Amendment 1  
 Client : ENVIRO RESOURCES MANAGEMENT  
 Project : 0207423 SYMPHONY



Sub-Matrix: SOIL

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>EP080: BTEXN (QCLot: 3160436) - continued</b>										
ES1324470-001	MK_SB82_3.9	EP080: ortho-Xylene	95-47-6	2.5 mg/kg	104	----	70	130	----	----
		EP080: Naphthalene	91-20-3	2.5 mg/kg	80.8	----	70	130	----	----
<b>EG005T: Total Metals by ICP-AES (QCLot: 3161227)</b>										
ES1324470-001	MK_SB82_3.9	EG005T: Arsenic	7440-38-2	50 mg/kg	113	----	70	130	----	----
		EG005T: Cadmium	7440-43-9	50 mg/kg	107	----	70	130	----	----
		EG005T: Chromium	7440-47-3	50 mg/kg	114	----	70	130	----	----
		EG005T: Copper	7440-50-8	125 mg/kg	112	----	70	130	----	----
		EG005T: Lead	7439-92-1	125 mg/kg	110	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	109	----	70	130	----	----
		EG005T: Selenium	7782-49-2	50 mg/kg	105	----	70	130	----	----
		EG005T: Zinc	7440-66-6	125 mg/kg	104	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3161228)</b>										
ES1324470-001	MK_SB82_3.9	EG035T: Mercury	7439-97-6	5 mg/kg	104	----	70	130	----	----



## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1324470</b>	Page	: 1 of 13
Amendment	: <b>1</b>		
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: 0207423 SYMPHONY	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: MT PIPER		
C-O-C number	: 11731,11732	Date Samples Received	: 12-NOV-2013
Sampler	: GP	Issue Date	: 22-JAN-2014
Order number	: ----		
Quote number	: SY/278/13 V3	No. of samples received	: 40
		No. of samples analysed	: 30

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EA055: Moisture Content</b>								
<b>Soil Glass Jar - Unpreserved (EA055-103)</b>								
MK_SB82_3.9, MK_SB76_3.0, MK_SB28_2.0, MK_SB34_2.0, MK_SB33_1.5, ML_SB27_0.05, ML_SB25_0.05, ML_SB37_0.05, ML_SB35_0.1,	MK_SB81_3.0, MK_SB86_1.5, MK_SB35_3.0, D_061113_01_GP, MK_SB22_1.5, ML_SB26_0.05, ML_SB36_0.05, ML_SB28_0.05, ML_SB38_0.05	06-NOV-2013	----	----	----	14-NOV-2013	20-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EA055-103)</b>								
MK_SB58_2.0, MK_SB38_3.8, MD_MW04_3.0	MK_SB40_2.0, MK_SB57_3.0,	07-NOV-2013	----	----	----	14-NOV-2013	21-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EA055-103)</b>								
MK_SB13_1.6		08-NOV-2013	----	----	----	14-NOV-2013	22-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EA055-103)</b>								
MK_SB54_0.15, D_111113_01_GP	MK_SB54_1.0,	11-NOV-2013	----	----	----	14-NOV-2013	25-NOV-2013	✓
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
<b>Snap Lock Bag (EA200)</b>								
ML_SB27_0.05, ML_SB25_0.05, ML_SB37_0.05, ML_SB35_0.1,	ML_SB26_0.05, ML_SB36_0.05, ML_SB28_0.05, ML_SB38_0.05	06-NOV-2013	---	05-MAY-2014	----	19-NOV-2013	18-MAY-2014	✓
<b>Snap Lock Bag (EA200)</b>								
MK_SB54_0.15		11-NOV-2013	---	10-MAY-2014	----	19-NOV-2013	18-MAY-2014	✓





Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EG005T: Total Metals by ICP-AES</b>								
<b>Soil Glass Jar - Unpreserved (EG005T)</b> ML_SB27_0.05, ML_SB25_0.05, ML_SB37_0.05, ML_SB35_0.1,	ML_SB26_0.05, ML_SB36_0.05, ML_SB28_0.05, ML_SB38_0.05	06-NOV-2013	14-NOV-2013	05-MAY-2014	✓	15-NOV-2013	05-MAY-2014	✓
<b>Soil Glass Jar - Unpreserved (EG005T)</b> MK_SB82_3.9, MK_SB76_3.0, MK_SB28_2.0, MK_SB34_2.0, MK_SB33_1.5,	MK_SB81_3.0, MK_SB86_1.5, MK_SB35_3.0, D_061113_01_GP, MK_SB22_1.5	06-NOV-2013	15-NOV-2013	05-MAY-2014	✓	18-NOV-2013	05-MAY-2014	✓
<b>Soil Glass Jar - Unpreserved (EG005T)</b> MK_SB40_2.0, MK_SB57_3.0,	MK_SB38_3.8, MD_MW04_3.0	07-NOV-2013	14-NOV-2013	06-MAY-2014	✓	15-NOV-2013	06-MAY-2014	✓
<b>Soil Glass Jar - Unpreserved (EG005T)</b> MK_SB58_2.0		07-NOV-2013	15-NOV-2013	06-MAY-2014	✓	18-NOV-2013	06-MAY-2014	✓
<b>Soil Glass Jar - Unpreserved (EG005T)</b> MK_SB13_1.6		08-NOV-2013	14-NOV-2013	07-MAY-2014	✓	15-NOV-2013	07-MAY-2014	✓
<b>Soil Glass Jar - Unpreserved (EG005T)</b> MK_SB54_0.15, D_111113_01_GP	MK_SB54_1.0,	11-NOV-2013	14-NOV-2013	10-MAY-2014	✓	15-NOV-2013	10-MAY-2014	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
<b>Soil Glass Jar - Unpreserved (EG035T)</b> ML_SB27_0.05, ML_SB25_0.05, ML_SB37_0.05, ML_SB35_0.1,	ML_SB26_0.05, ML_SB36_0.05, ML_SB28_0.05, ML_SB38_0.05	06-NOV-2013	14-NOV-2013	04-DEC-2013	✓	15-NOV-2013	04-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EG035T)</b> MK_SB82_3.9, MK_SB76_3.0, MK_SB28_2.0, MK_SB34_2.0, MK_SB33_1.5,	MK_SB81_3.0, MK_SB86_1.5, MK_SB35_3.0, D_061113_01_GP, MK_SB22_1.5	06-NOV-2013	15-NOV-2013	04-DEC-2013	✓	18-NOV-2013	04-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EG035T)</b> MK_SB40_2.0, MK_SB57_3.0,	MK_SB38_3.8, MD_MW04_3.0	07-NOV-2013	14-NOV-2013	05-DEC-2013	✓	15-NOV-2013	05-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EG035T)</b> MK_SB58_2.0		07-NOV-2013	15-NOV-2013	05-DEC-2013	✓	18-NOV-2013	05-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EG035T)</b> MK_SB13_1.6		08-NOV-2013	14-NOV-2013	06-DEC-2013	✓	15-NOV-2013	06-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EG035T)</b> MK_SB54_0.15, D_111113_01_GP	MK_SB54_1.0,	11-NOV-2013	14-NOV-2013	09-DEC-2013	✓	15-NOV-2013	09-DEC-2013	✓



Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
<b>Soil Glass Jar - Unpreserved (EP066)</b> MK_SB76_3.0, MK_SB35_3.0,	MK_SB28_2.0, MK_SB22_1.5	06-NOV-2013	14-NOV-2013	20-NOV-2013	✓	15-NOV-2013	24-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP066)</b> MK_SB40_2.0, MK_SB57_3.0	MK_SB38_3.8,	07-NOV-2013	14-NOV-2013	21-NOV-2013	✓	15-NOV-2013	24-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP066)</b> MK_SB54_1.0		11-NOV-2013	14-NOV-2013	25-NOV-2013	✓	15-NOV-2013	24-DEC-2013	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
<b>Soil Glass Jar - Unpreserved (EP071)</b> MK_SB82_3.9, MK_SB76_3.0, MK_SB28_2.0, MK_SB34_2.0, MK_SB33_1.5, ML_SB27_0.05, ML_SB25_0.05, ML_SB37_0.05,	MK_SB81_3.0, MK_SB86_1.5, MK_SB35_3.0, D_061113_01_GP, MK_SB22_1.5, ML_SB26_0.05, ML_SB36_0.05, ML_SB28_0.05	06-NOV-2013	14-NOV-2013	20-NOV-2013	✓	14-NOV-2013	24-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP071)</b> ML_SB35_0.1,	ML_SB38_0.05	06-NOV-2013	15-NOV-2013	20-NOV-2013	✓	15-NOV-2013	25-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP071)</b> MK_SB58_2.0, MK_SB38_3.8,	MK_SB40_2.0, MK_SB57_3.0	07-NOV-2013	14-NOV-2013	21-NOV-2013	✓	14-NOV-2013	24-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP071)</b> MD_MW04_3.0		07-NOV-2013	15-NOV-2013	21-NOV-2013	✓	15-NOV-2013	25-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP071)</b> MK_SB13_1.6		08-NOV-2013	15-NOV-2013	22-NOV-2013	✓	15-NOV-2013	25-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP071)</b> MK_SB54_0.15, D_111113_01_GP	MK_SB54_1.0,	11-NOV-2013	15-NOV-2013	25-NOV-2013	✓	15-NOV-2013	25-DEC-2013	✓
<b>EP074D: Fumigants</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB76_3.0, MK_SB35_3.0, ML_SB27_0.05, ML_SB25_0.05, ML_SB37_0.05, ML_SB35_0.1,	MK_SB28_2.0, MK_SB22_1.5, ML_SB26_0.05, ML_SB36_0.05, ML_SB28_0.05, ML_SB38_0.05	06-NOV-2013	13-NOV-2013	13-NOV-2013	✓	13-NOV-2013	13-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB40_2.0, MK_SB57_3.0,	MK_SB38_3.8, MD_MW04_3.0	07-NOV-2013	13-NOV-2013	14-NOV-2013	✓	13-NOV-2013	14-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB54_1.0		11-NOV-2013	13-NOV-2013	18-NOV-2013	✓	13-NOV-2013	18-NOV-2013	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP074E: Halogenated Aliphatic Compounds</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB76_3.0, MK_SB35_3.0, ML_SB27_0.05, ML_SB25_0.05, ML_SB37_0.05, ML_SB35_0.1, MK_SB28_2.0, MK_SB22_1.5, ML_SB26_0.05, ML_SB36_0.05, ML_SB28_0.05, ML_SB38_0.05	<b>06-NOV-2013</b>	<b>13-NOV-2013</b>	13-NOV-2013	✓	<b>13-NOV-2013</b>	13-NOV-2013	✓	
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB40_2.0, MK_SB57_3.0, MK_SB38_3.8, MD_MW04_3.0	<b>07-NOV-2013</b>	<b>13-NOV-2013</b>	14-NOV-2013	✓	<b>13-NOV-2013</b>	14-NOV-2013	✓	
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB54_1.0	<b>11-NOV-2013</b>	<b>13-NOV-2013</b>	18-NOV-2013	✓	<b>13-NOV-2013</b>	18-NOV-2013	✓	
<b>EP074F: Halogenated Aromatic Compounds</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB76_3.0, MK_SB35_3.0, ML_SB27_0.05, ML_SB25_0.05, ML_SB37_0.05, ML_SB35_0.1, MK_SB28_2.0, MK_SB22_1.5, ML_SB26_0.05, ML_SB36_0.05, ML_SB28_0.05, ML_SB38_0.05	<b>06-NOV-2013</b>	<b>13-NOV-2013</b>	13-NOV-2013	✓	<b>13-NOV-2013</b>	13-NOV-2013	✓	
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB40_2.0, MK_SB57_3.0, MK_SB38_3.8, MD_MW04_3.0	<b>07-NOV-2013</b>	<b>13-NOV-2013</b>	14-NOV-2013	✓	<b>13-NOV-2013</b>	14-NOV-2013	✓	
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB54_1.0	<b>11-NOV-2013</b>	<b>13-NOV-2013</b>	18-NOV-2013	✓	<b>13-NOV-2013</b>	18-NOV-2013	✓	
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB76_3.0, MK_SB35_3.0, ML_SB27_0.05, ML_SB25_0.05, ML_SB37_0.05, ML_SB35_0.1, MK_SB28_2.0, MK_SB22_1.5, ML_SB26_0.05, ML_SB36_0.05, ML_SB28_0.05, ML_SB38_0.05	<b>06-NOV-2013</b>	<b>13-NOV-2013</b>	13-NOV-2013	✓	<b>13-NOV-2013</b>	13-NOV-2013	✓	
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB40_2.0, MK_SB57_3.0, MK_SB38_3.8, MD_MW04_3.0	<b>07-NOV-2013</b>	<b>13-NOV-2013</b>	14-NOV-2013	✓	<b>13-NOV-2013</b>	14-NOV-2013	✓	
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB54_1.0	<b>11-NOV-2013</b>	<b>13-NOV-2013</b>	18-NOV-2013	✓	<b>13-NOV-2013</b>	18-NOV-2013	✓	



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP074B: Oxygenated Compounds</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB76_3.0, MK_SB35_3.0, ML_SB27_0.05, ML_SB25_0.05, ML_SB37_0.05, ML_SB35_0.1, MK_SB28_2.0, MK_SB22_1.5, ML_SB26_0.05, ML_SB36_0.05, ML_SB28_0.05, ML_SB38_0.05	06-NOV-2013	13-NOV-2013	13-NOV-2013	✓	13-NOV-2013	13-NOV-2013	✓	
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB40_2.0, MK_SB57_3.0, MK_SB38_3.8, MD_MW04_3.0	07-NOV-2013	13-NOV-2013	14-NOV-2013	✓	13-NOV-2013	14-NOV-2013	✓	
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB54_1.0	11-NOV-2013	13-NOV-2013	18-NOV-2013	✓	13-NOV-2013	18-NOV-2013	✓	
<b>EP074C: Sulfonated Compounds</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB76_3.0, MK_SB35_3.0, ML_SB27_0.05, ML_SB25_0.05, ML_SB37_0.05, ML_SB35_0.1, MK_SB28_2.0, MK_SB22_1.5, ML_SB26_0.05, ML_SB36_0.05, ML_SB28_0.05, ML_SB38_0.05	06-NOV-2013	13-NOV-2013	13-NOV-2013	✓	13-NOV-2013	13-NOV-2013	✓	
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB40_2.0, MK_SB57_3.0, MK_SB38_3.8, MD_MW04_3.0	07-NOV-2013	13-NOV-2013	14-NOV-2013	✓	13-NOV-2013	14-NOV-2013	✓	
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB54_1.0	11-NOV-2013	13-NOV-2013	18-NOV-2013	✓	13-NOV-2013	18-NOV-2013	✓	
<b>EP074G: Trihalomethanes</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB76_3.0, MK_SB35_3.0, ML_SB27_0.05, ML_SB25_0.05, ML_SB37_0.05, ML_SB35_0.1, MK_SB28_2.0, MK_SB22_1.5, ML_SB26_0.05, ML_SB36_0.05, ML_SB28_0.05, ML_SB38_0.05	06-NOV-2013	13-NOV-2013	13-NOV-2013	✓	13-NOV-2013	13-NOV-2013	✓	
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB40_2.0, MK_SB57_3.0, MK_SB38_3.8, MD_MW04_3.0	07-NOV-2013	13-NOV-2013	14-NOV-2013	✓	13-NOV-2013	14-NOV-2013	✓	
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB54_1.0	11-NOV-2013	13-NOV-2013	18-NOV-2013	✓	13-NOV-2013	18-NOV-2013	✓	



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP075(SIM)A: Phenolic Compounds</b>								
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MK_SB82_3.9, MK_SB76_3.0, MK_SB28_2.0, MK_SB34_2.0, MK_SB33_1.5, ML_SB27_0.05, ML_SB25_0.05, ML_SB37_0.05, MK_SB81_3.0, MK_SB86_1.5, MK_SB35_3.0, D_061113_01_GP, MK_SB22_1.5, ML_SB26_0.05, ML_SB36_0.05, ML_SB28_0.05	06-NOV-2013	14-NOV-2013	20-NOV-2013	✓	15-NOV-2013	24-DEC-2013	✓	
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> ML_SB35_0.1, ML_SB38_0.05	06-NOV-2013	15-NOV-2013	20-NOV-2013	✓	15-NOV-2013	25-DEC-2013	✓	
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MK_SB58_2.0, MK_SB38_3.8, MK_SB40_2.0, MK_SB57_3.0	07-NOV-2013	14-NOV-2013	21-NOV-2013	✓	15-NOV-2013	24-DEC-2013	✓	
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MD_MW04_3.0	07-NOV-2013	15-NOV-2013	21-NOV-2013	✓	15-NOV-2013	25-DEC-2013	✓	
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MK_SB13_1.6	08-NOV-2013	15-NOV-2013	22-NOV-2013	✓	15-NOV-2013	25-DEC-2013	✓	
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MK_SB54_0.15, D_111113_01_GP, MK_SB54_1.0	11-NOV-2013	15-NOV-2013	25-NOV-2013	✓	15-NOV-2013	25-DEC-2013	✓	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MK_SB82_3.9, MK_SB76_3.0, MK_SB28_2.0, MK_SB34_2.0, MK_SB33_1.5, ML_SB27_0.05, ML_SB25_0.05, ML_SB37_0.05, MK_SB81_3.0, MK_SB86_1.5, MK_SB35_3.0, D_061113_01_GP, MK_SB22_1.5, ML_SB26_0.05, ML_SB36_0.05, ML_SB28_0.05	06-NOV-2013	14-NOV-2013	20-NOV-2013	✓	15-NOV-2013	24-DEC-2013	✓	
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> ML_SB35_0.1, ML_SB38_0.05	06-NOV-2013	15-NOV-2013	20-NOV-2013	✓	15-NOV-2013	25-DEC-2013	✓	
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MK_SB58_2.0, MK_SB38_3.8, MK_SB40_2.0, MK_SB57_3.0	07-NOV-2013	14-NOV-2013	21-NOV-2013	✓	15-NOV-2013	24-DEC-2013	✓	
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MD_MW04_3.0	07-NOV-2013	15-NOV-2013	21-NOV-2013	✓	15-NOV-2013	25-DEC-2013	✓	
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MK_SB13_1.6	08-NOV-2013	15-NOV-2013	22-NOV-2013	✓	15-NOV-2013	25-DEC-2013	✓	
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MK_SB54_0.15, D_111113_01_GP, MK_SB54_1.0	11-NOV-2013	15-NOV-2013	25-NOV-2013	✓	15-NOV-2013	25-DEC-2013	✓	



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP080: BTEXN</b>							
<b>Soil Glass Jar - Unpreserved (EP080)</b> TRIP BLANK	04-NOV-2013	15-NOV-2013	18-NOV-2013	✓	16-NOV-2013	18-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB76_3.0, MK_SB35_3.0, ML_SB27_0.05, ML_SB25_0.05, ML_SB37_0.05, ML_SB35_0.1, MK_SB28_2.0, MK_SB22_1.5, ML_SB26_0.05, ML_SB36_0.05, ML_SB28_0.05, ML_SB38_0.05	06-NOV-2013	13-NOV-2013	20-NOV-2013	✓	13-NOV-2013	20-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB82_3.9, MK_SB86_1.5, D_061113_01_GP, MK_SB81_3.0, MK_SB34_2.0, MK_SB33_1.5	06-NOV-2013	15-NOV-2013	20-NOV-2013	✓	16-NOV-2013	20-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB40_2.0, MK_SB57_3.0, MK_SB38_3.8, MD_MW04_3.0	07-NOV-2013	13-NOV-2013	21-NOV-2013	✓	13-NOV-2013	21-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB58_2.0	07-NOV-2013	15-NOV-2013	21-NOV-2013	✓	16-NOV-2013	21-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB13_1.6	08-NOV-2013	15-NOV-2013	22-NOV-2013	✓	16-NOV-2013	22-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB54_1.0	11-NOV-2013	13-NOV-2013	25-NOV-2013	✓	13-NOV-2013	25-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB54_0.15, D_111113_01_GP	11-NOV-2013	15-NOV-2013	25-NOV-2013	✓	16-NOV-2013	25-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> TRIP SPIKE, TSC	30-OCT-2013	13-NOV-2013	13-NOV-2013	✓	13-NOV-2013	13-NOV-2013	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP080/071: Total Petroleum Hydrocarbons</b>							
<b>Soil Glass Jar - Unpreserved (EP080)</b> TRIP BLANK	04-NOV-2013	15-NOV-2013	18-NOV-2013	✓	16-NOV-2013	18-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB76_3.0, MK_SB28_2.0, MK_SB35_3.0, MK_SB22_1.5, ML_SB27_0.05, ML_SB26_0.05, ML_SB25_0.05, ML_SB36_0.05, ML_SB37_0.05, ML_SB28_0.05, ML_SB35_0.1, ML_SB38_0.05	06-NOV-2013	13-NOV-2013	20-NOV-2013	✓	13-NOV-2013	20-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB82_3.9, MK_SB81_3.0, MK_SB86_1.5, MK_SB34_2.0, D_061113_01_GP, MK_SB33_1.5	06-NOV-2013	15-NOV-2013	20-NOV-2013	✓	16-NOV-2013	20-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB40_2.0, MK_SB38_3.8, MK_SB57_3.0, MD_MW04_3.0	07-NOV-2013	13-NOV-2013	21-NOV-2013	✓	13-NOV-2013	21-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB58_2.0	07-NOV-2013	15-NOV-2013	21-NOV-2013	✓	16-NOV-2013	21-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB13_1.6	08-NOV-2013	15-NOV-2013	22-NOV-2013	✓	16-NOV-2013	22-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB54_1.0	11-NOV-2013	13-NOV-2013	25-NOV-2013	✓	13-NOV-2013	25-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB54_0.15, D_111113_01_GP	11-NOV-2013	15-NOV-2013	25-NOV-2013	✓	16-NOV-2013	25-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> TRIP SPIKE, TSC	30-OCT-2013	13-NOV-2013	13-NOV-2013	✓	13-NOV-2013	13-NOV-2013	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Moisture Content	EA055-103	6	60	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	4	40	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	6	56	10.7	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	6	56	10.7	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	4	40	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	4	39	10.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	17	11.8	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	3	56	5.4	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	3	56	5.4	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	39	5.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
PAH/Phenols (SIM)	EP075(SIM)	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	3	56	5.4	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	3	56	5.4	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	39	5.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	3	56	5.4	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	3	56	5.4	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	40	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	39	5.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement





## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Asbestos Identification in bulk solids	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples
Asbestos - Quantitative Analysis	* EA200O	SOIL	Asbestos Materials Content with Confirmation of Identification by AS 4964 - 2004 Asbestos
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (2013) Schedule B(3) (Method 506.1)
Volatile Organic Compounds	EP074	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option A - Concentrating)	ORG17A	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

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Work Order : ES1324470 Amendment 1  
Client : ENVIRO RESOURCES MANAGEMENT  
Project : 0207423 SYMPHONY



<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.



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## Summary of Outliers

### **Outliers : Quality Control Samples**

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### ***Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes***

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.
- For all matrices, no Matrix Spike outliers occur.

#### ***Regular Sample Surrogates***

- For all regular sample matrices, no surrogate recovery outliers occur.

### **Outliers : Analysis Holding Time Compliance**

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- No Analysis Holding Time Outliers exist.

### **Outliers : Frequency of Quality Control Samples**

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.
-

**SAMPLE RECEIPT NOTIFICATION (SRN)****Comprehensive Report**

**Work Order** : ES1324470  
**Amendment** : 1

**Client** : ENVIRO RESOURCES MANAGEMENT  
**Contact** : MR JONATHAN LEKAWSKI  
**Address** : GROUND FLOOR  
33 SAUNDERS STREET, PYRMONT  
NSW 2009  
LOCKED BAG 24  
BROADWAY NSW, AUSTRALIA 2007

**Laboratory** : Environmental Division Sydney  
**Contact** : Barbara Hanna  
**Address** : 277-289 Woodpark Road Smithfield  
NSW Australia 2164

**E-mail** : jonathan.lekawski@erm.com  
**Telephone** : +61 02 8584 8888  
**Facsimile** : +61 02 8584 8800

**E-mail** : Barbara.Hanna@alsglobal.com  
**Telephone** : +61 2 8784 8555  
**Facsimile** : +61 2 8784 8555

**Project** : 0207423 SYMPHONY  
**Order number** : ----  
**C-O-C number** : 11731,11732  
**Site** : MT PIPER  
**Sampler** : GP

**Page** : 1 of 3  
**Quote number** : ES2013ENVRES0370 (SY/278/13 V3)  
**QC Level** : NEPM 2013 Schedule B(3) and ALS QCS3 requirement

**Dates**

**Date Samples Received** : 12-NOV-2013  
**Client Requested Due Date** : 22-JAN-2014  
**Issue Date** : 22-JAN-2014  
**Scheduled Reporting Date** : **22-JAN-2014**

**Delivery Details**

**Mode of Delivery** : Carrier  
**No. of coolers/boxes** : 1 HARD  
**Security Seal** : Not intact  
**Temperature** : 8.3°C - Ice bricks present  
**No. of samples received** : 40  
**No. of samples analysed** : 30

**General Comments**

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Samples received in appropriately pretreated and preserved containers.
- Sample T\_061113\_01\_GP to be forwarded to Envirolab.
- Samples TRIP BLANK, TRIP SPIKE and TRIP SPIKE CONTROL were received extra and will be analysed for TPH C6-C10/BTEX. Please notify if this is not required.
- **Samples received in appropriately pretreated and preserved containers.**
- **Asbestos analysis will be conducted by ALS Newcastle.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Breaches in recommended extraction / analysis holding times may occur. Please refer to the 'Proactive Holding Time Report' below for further details. Please contact ALS if further information is required.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- No sample container / preservation non-compliance exist.

### Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL	No analysis requested SOIL - EA200N	Asbestos - Estimated Percentage by SOIL - EG005T (solids)	Total Metals by ICP-AES SOIL - EP066 (solids)	Polychlorinated Biphenyls by GCMS SOIL - EP074 (solids)	Volatile Organic Compounds SOIL - S-18 (NO MOIST)	TRH(C6-C9)/BTEXN with No Moisture SOIL - S-27	TRH/BTEXN/PAH/Phenols/8Metals
ES1324470-001	06-NOV-2013 15:00	MK_SB82_3.9			✓					✓
ES1324470-002	06-NOV-2013 15:00	MK_SB81_3.0			✓					✓
ES1324470-003	06-NOV-2013 15:00	MK_SB76_3.0			✓	✓	✓			✓
ES1324470-004	06-NOV-2013 15:00	MK_SB86_1.5			✓					✓
ES1324470-005	06-NOV-2013 15:00	MK_SB86_3.9	✓							
ES1324470-006	06-NOV-2013 15:00	MK_SB28_2.0			✓	✓	✓			✓
ES1324470-007	06-NOV-2013 15:00	MK_SB28_3.0	✓							
ES1324470-008	06-NOV-2013 15:00	MK_SB35_3.0			✓	✓	✓			✓
ES1324470-009	06-NOV-2013 15:00	MK_SB35_3.9	✓							
ES1324470-010	06-NOV-2013 15:00	MK_SB34_2.0			✓					✓
ES1324470-011	06-NOV-2013 15:00	MK_SB34_3.9	✓							
ES1324470-012	06-NOV-2013 15:00	D_061113_01_GP			✓					✓
ES1324470-013	06-NOV-2013 15:00	MK_SB33_1.5			✓					✓
ES1324470-014	06-NOV-2013 15:00	MK_SB33_1.8	✓							
ES1324470-015	06-NOV-2013 15:00	MK_SB22_1.5			✓	✓	✓			✓
ES1324470-016	07-NOV-2013 15:00	MK_SB58_2.0			✓					✓
ES1324470-017	07-NOV-2013 15:00	MK_SB58_3.9	✓							
ES1324470-018	07-NOV-2013 15:00	MK_SB40_1.5	✓							
ES1324470-019	07-NOV-2013 15:00	MK_SB40_2.0			✓	✓	✓			✓
ES1324470-020	07-NOV-2013 15:00	MK_SB38_2.0	✓							
ES1324470-021	07-NOV-2013 15:00	MK_SB38_3.8			✓	✓	✓			✓
ES1324470-022	07-NOV-2013 15:00	MK_SB57_3.0			✓	✓	✓			✓
ES1324470-023	07-NOV-2013 15:00	MK_SB57_3.9	✓							
ES1324470-024	06-NOV-2013 15:00	ML_SB27_0.05		✓	✓		✓			✓
ES1324470-025	06-NOV-2013 15:00	ML_SB26_0.05		✓	✓		✓			✓
ES1324470-026	06-NOV-2013 15:00	ML_SB25_0.05		✓	✓		✓			✓
ES1324470-027	06-NOV-2013 15:00	ML_SB36_0.05		✓	✓		✓			✓
ES1324470-028	06-NOV-2013 15:00	ML_SB37_0.05		✓	✓		✓			✓
ES1324470-029	06-NOV-2013 15:00	ML_SB28_0.05		✓	✓		✓			✓
ES1324470-030	06-NOV-2013 15:00	ML_SB35_0.1		✓	✓		✓			✓
ES1324470-031	06-NOV-2013 15:00	ML_SB38_0.05		✓	✓		✓			✓
ES1324470-032	07-NOV-2013 15:00	MD_MW04_2.0	✓							
ES1324470-033	07-NOV-2013 15:00	MD_MW04_3.0			✓		✓			✓
ES1324470-034	08-NOV-2013 15:00	MK_SB13_1.6			✓					✓
ES1324470-035	11-NOV-2013 15:00	MK_SB54_0.15		✓	✓					✓



			(On Hold) SOIL	No analysis requested	SOIL - EA200N	Asbestos - Estimated Percentage by	SOIL - EG005T (solids)	Total Metals by ICP-AES	SOIL - EP066 (solids)	Polychlorinated Biphenyls by GCMS	SOIL - EP074 (solids)	Volatile Organic Compounds	SOIL - S-18 (NO MOIST)	TRH(C6-C9)/BTEXN with No Moisture	SOIL - S-27	TRH/BTEXN/PAH/Phenols/8Metals
ES1324470-036	11-NOV-2013 15:00	MK_SB54_1.0					✓		✓		✓					✓
ES1324470-037	11-NOV-2013 15:00	D_111113_01_GP					✓									✓
ES1324470-038	04-NOV-2013 15:00	TRIP BLANK											✓			
ES1324470-039	30-OCT-2013 15:00	TRIP SPIKE											✓			
ES1324470-040	30-OCT-2013 15:00	TSC											✓			

### Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

### Requested Deliverables

#### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

#### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com

#### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
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Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com

#### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

Sydney  Melbourne  Brisbane  Perth  Hunter Valley  North Coast  Other

Gnd Floor, 33 Saunders Street, Pymont, NSW, 2009. (ph) 02 8584 8888 (fax) 02 8584 8800  
 Level 3, Yarra Tower, WTC, 18-38 Siddaley Street, Docklands, VIC, 3005. (ph) 03 9696 8011 (fax) 03 9696 8022  
 Level 1, 60 Leichhardt Street, Spring Hill, QLD, 4004. (ph) 07 3839 8393 (fax) 07 3839 8381  
 Level 6, Grain Pool Bld, 172 St Georges Tce, WA, 6850. (ph) 08 9321 5200 (fax) 08 9321 5262  
 53 Bonville Avenue, Thornton, NSW, 2322. (ph) 02 4964 2150 (fax) 02 4964 2152  
 Suite 3/146 Gordon Street, Port Macquarie, NSW, 2444. (ph) 02 6584 7155 (fax) 02 6584 7160

Project No: 0107473  
 Project Name: Symphony  
 Project Location: Mt. Piper  
 Project Manager: Jonathan LeKawski  
 Sampler: Gavin Powell

Environmental Division  
 Sydney  
 Work Order  
**ES1324470**

Telephone: +61-2-8784 8555

Laboratory Number	Sample ID	Sample Depth	Sample Date	Sample Time	Matrix		Preservation			Containers (number/type)	Yes (tick)	BTEX	Speciated TPH	VOC Scan (USEPA 8260 LSI)	SVOC Scan (USEPA 8270 LSI)	OC OP Pesticides	PAH	Phenols	PCB	Metals* (dissolved / total)	VOC Scan	HOLD	Other Comments on sample (eg: high voc, highly contaminated, special detection limits etc etc)
					Soil	Water	Other	Is	Acid														
1	MK-S82-3-9		6/11		X					1		X	X	X	X	X	X	X	X	X	X		
2	MK-S81-3-9									1		X	X	X	X	X	X	X	X	X	X		
3	MK-S87-3-9									1		X	X	X	X	X	X	X	X	X	X		
4	MK-S88-1-5									1		X	X	X	X	X	X	X	X	X	X		
5	MK-S82-3-9									1		X	X	X	X	X	X	X	X	X	X		
6	MK-S88-2-0									1		X	X	X	X	X	X	X	X	X	X		
7	MK-S82-3-9									1		X	X	X	X	X	X	X	X	X	X		
8	MK-S82-3-9									1		X	X	X	X	X	X	X	X	X	X		
9	MK-S83-3-9									1		X	X	X	X	X	X	X	X	X	X		
10	MK-S83-2-0									1		X	X	X	X	X	X	X	X	X	X		
11	MK-S84-3-9									1		X	X	X	X	X	X	X	X	X	X		
12	D-861B-01-09									1		X	X	X	X	X	X	X	X	X	X		
-	T-06113-01-09									1		X	X	X	X	X	X	X	X	X	X		
13	MK-S83-1-5									1		X	X	X	X	X	X	X	X	X	X		
14	MK-S83-1-8		6/11							1		X	X	X	X	X	X	X	X	X	X		
15	MK-S82-1-5		6/11							1		X	X	X	X	X	X	X	X	X	X		
16	MK-S88-2-0		7/11							1		X	X	X	X	X	X	X	X	X	X		
17	MK-S88-3-9									1		X	X	X	X	X	X	X	X	X	X		
18	MK-S80-1-5									1		X	X	X	X	X	X	X	X	X	X		

Comments: quote # SY/278/13, email symphony.detta@erm.com  
 Metals (total): As Cd Cr Cu Hg Ni Pb Zn Se

Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_

to EnviroLab please

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 Strife 3/146 Gordon Street, Port Macquarie, NSW, 2444. (ph) 02 6584 7155 (fax) 02 6584 7160

Project No: 0207973  
 Project Name: Symphony  
 Project Location: Mt Piper  
 Project Manager: Jonathan Leksowski  
 Sampler: Gavin Finney

COC Number  
**A 11732**  
 Laboratory  
**ALS**

Laboratory Number	Sample ID	Sample Depth	Sample Date	Sample Time	Matrix				Preservation			Containers (num/type)	BTEX	TPH (C6-C9 P & T) +	Speciated TPH	VOC Scan (USEPA 8260 List)	SVOC Scan (USEPA 8270 List)	OC Pesticides	PAH	Phenols	PCB	Metals* (dissolved / total)	Address	Other Comments on sample (eg: high voc, highly contaminated; special detection limits etc etc)												
					Soil	Water	Air	Ice	Acid	Filter	Other														Yes	(tick)										
																											1	2	3	4	5	6	7	8	9	10
19	MK-SB40-2.0		7/11		X				X										X	X	X	VOC Scan	Address 96 West													
20	MK-SB38-2.0				X				X										X	X	X															
21	MK-SB38-3.8				X				X										X	X	X															
22	MK-SB57-3.0				X				X										X	X	X															
23	MK-SB57-3.9		7/11		X				X										X	X	X															
24	ML-SB2Z-0.05	6/11			X				X										X	X	X															
25	ML-SB2G-0.05				X				X										X	X	X															
26	ML-SB2S-0.05				X				X										X	X	X															
27	ML-SB36-0.05				X				X										X	X	X															
28	ML-SB37-0.05				X				X										X	X	X															
29	ML-SB28-0.05				X				X										X	X	X															
30	ML-SB25-0.1				X				X										X	X	X															
31	ML-SB38-0.05				X				X										X	X	X															
32	MO-MN04-1.0		7/11		X				X										X	X	X															
33	MD-MN104-3.0		7/11		X				X										X	X	X															
34	MK-SB13-1.6		8/11		X				X										X	X	X															
35	MK-SB54-0.15		11/11		X				X										X	X	X															
26	MK-SB57-1.0				X				X										X	X	X															
37	DJ1115-01-0P				X				X										X	X	X															

Comments: quote # SY/278/13, email symphony.de@westerm.com  
 Received by: [Signature]  
 Date/Time: [Blank]

Relinquished by: [Signature]  
 Date/Time: [Blank]

Relinquished by: [Signature]  
 Date/Time: [Blank]

Relinquished by: [Signature]  
 Date/Time: [Blank]

Relinquished by: [Signature]  
 Date/Time: [Blank]

Relinquished by: [Signature]  
 Date/Time: [Blank]

Relinquished by: [Signature]  
 Date/Time: [Blank]



Project No: 0207473  
 Project Name: Symphony  
 Project Location: Mt Piper  
 Project Manager: Jonathan Lekawski  
 Sampler: Gavin Powell

COC Number  
**A 11731**  
 Laboratory  
**ALS**

ERM  
 General Analysis Requirements  
 Turn Around Time (please tick):  1 Day  2 Days  3 Days  Normal TAT  
 Do you wish any sediment layers in water to be excluded from extractions?  
 Additional QA/QC reported where sample batches are < 10 samples?  
 % of extraneous material removed from samples to be reported as per NEPM 5.1.1?

Laboratory Number	Sample ID	Sample Depth	Sample Date	Sample Time	Matrix		Preservation			Containers (numerator)	Yes (tick)	Other Comments on sample (eg. high voc, highly contaminated, special detection limits etc etc)
					Water	Sediment	Acid	Filter	Other			
1	MK-S882-3-9		6/11		X		X			1		
2	MK-S881-3-0									1		
3	MK-S871-3-0									1		
4	MK-S886-1-5									1		
5	MK-S886-3-9									1		
6	MK-S828-2-0									1		
7	MK-S828-3-0									1		
8	MK-S835-1-0									1		
9	MK-S835-3-9									1		
10	MK-S834-2-0									1		
11	MK-S834-3-9									1		
12	D-861B-01-0P									1		
13	MK-S833-1-5									1		
14	MK-S832-1-8		6/11							1		
15	MK-S822-1-5		6/11							1		
16	MK-S858-2-0		7/11							1		
17	MK-S858-3-9									1		
18	MK-S840-1-5									1		

Environmental Division  
 Sydney  
 Work Order  
**ES1324470**  
 Telephone : + 61-2-8784 8555



Subcon Forward Lab Split WO  
 Lab Analysis: Adelaide Newcastle  
 Organised By / Date: J.S.A. Giffen/WAB  
 Relinquished By / Date:  
 Connote / Courier:  
 WO No: 2522470  
 Attach By PO / Internal Sheet: 1-1-1

Comments: quote # SY/278/13, email symphony.delta.rest@erm.com  
 Relinquished by: [Signature] Date/Time: 12/1/13 9:30  
 Relinquished by: [Signature] Date/Time: [Blank]



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- North Coast
- Other

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 53 Bonville Avenue, Thornton, NSW, 2322. (ph) 02 4964 2150 (fax) 02 4964 2152  
 Suite 3/146 Gordon Street, Port Macquarie, NSW, 2444. (ph) 02 6584 7155 (fax) 02 6584 7160

Project No: 0207973  
 Project Name: Symphony  
 Project Location: Mt Piper  
 Project Manager: Jonathan Leksowski  
 Sampler: Gavin Pinol

COC Number: A 11732  
 Laboratory: ALS

General Analysis Requirements  
 1. Turn Around Time (please tick):  1 Day  3 Days  Normal (TAT)  
 2. Do you wish any sediment layers in water to be excluded from extractions?  
 3. Additional QAC reported where sample batches are < 10 samples?  
 4. % of extraneous material removed from samples to be reported as per NIEPM 5.1.1?

Laboratory Number	Sample ID	Sample Depth	Sample Date	Sample Time	Matrix		Preservation			Containers (num/type)	Yes (tick)	Other Comments on sample (eg: high voc, highly contaminated, special detection limits etc etc)
					Water	Soil	Other	Ice	Acid			
19	MK-SB40-2.0		7/11		X		X			1		
20	MK-SB38-2.0				X		X			1		
21	MK-SB38-3.8				X		X			1		
22	MK-SB57-3.0				X		X			1		
23	MK-SB57-3.9		7/11		X		X			1		
24	ML-SB27-0.05	6/11			X		X			2		
25	ML-SB26-0.05				X		X			2		
26	ML-SB25-0.05				X		X			2		
27	ML-SB26-0.05				X		X			2		
28	ML-SB37-0.05				X		X			2		
29	ML-SB28-0.05				X		X			2		
30	ML-SB25-0.1				X		X			2		
31	ML-SB38-0.05				X		X			2		
32	MD-MND4-1.0		7/11		X		X			1		
33	MD-MND4-3.0		7/11		X		X			1		
34	MK-SB13-1.6		8/11		X		X			1		
35	MK-SB54-0.15		11/11		X		X			2		
36	MK-SB34-1.0				X		X			1		
37	DJ1115-01-0P				X		X			1		

Comments: quote # SY/278/13, email symphony.deltawest@erm.com  
 Relinquished by: Signed: Date/Time: Received by: Date/Time:

## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>ES1324471</b> <b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : MR JONATHAN LEKAWSKI <b>Address</b> : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007  <b>E-mail</b> : jonathan.lekawski@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800 <b>Project</b> : 0207423 SYMPHONY <b>Order number</b> : ---- <b>C-O-C number</b> : 11733 <b>Sampler</b> : CP <b>Site</b> : MT.PIPES  <b>Quote number</b> : SY/278/13 V3	<b>Page</b> : 1 of 9  <b>Laboratory</b> : Environmental Division Sydney <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164  <b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555 <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement  <b>Date Samples Received</b> : 12-NOV-2013 <b>Issue Date</b> : 19-NOV-2013  <b>No. of samples received</b> : 6 <b>No. of samples analysed</b> : 4
---	---

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits



NATA Accredited Laboratory 825  
 Accredited for compliance with  
 ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Christopher Owler	Team Leader - Asbestos	Newcastle - Asbestos
Pabi Subba	Senior Organic Chemist	Sydney Organics



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EA200 Legend**
- **EA200 'Am' Amosite (brown asbestos)**
- **EA200 'Ch' Chrysotile (white asbestos)**
- **EA200 'Cr' Crocidolite (blue asbestos)**
- **EA200 'Trace' - Asbestos fibres detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres**
- **EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.**
- **EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.**
- **EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.**
- **EA200Q: ALS laboratory procedures and methods used for the identification and quantitation of asbestos are consistent with AS4964-2004 and the requirements of the 2013 NEPM for Assessment of Site Contamination**
- **EA200Q: Asbestos weights and percentages are not covered under the Scope of NATA Accreditation.**  
Weights of Asbestos are based on extracted bulk asbestos, fibre bundles, and/or ACM and do not include respirable fibres (if present).  
Percentages for Asbestos content in ACM are based on the 2013 NEPM default values. All numerical results under this method are approximate and should be used as a guide only.



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				T_111113_01_GP	MD_MW03_0.3	MD_MW02_0.5	MD_MW02_1.0	----
				11-NOV-2013 15:00	11-NOV-2013 15:00	11-NOV-2013 15:00	11-NOV-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1324471-001	ES1324471-002	ES1324471-005	ES1324471-006	----
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	15.4	13.6	----	15.1	----
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	----	No	No	----	----
Asbestos Type	1332-21-4	1	--	----	-	-	----	----
Sample weight (dry)	----	0.01	g	----	185	181	----	----
APPROVED IDENTIFIER:	----	1	--	----	C.OWLER	C.OWLER	----	----
<b>EA200Q: Asbestos Quantification (non-NATA)</b>								
Weight Used for % Calculation	----	0.0001	kg	----	0.185	0.181	----	----
Asbestos Containing Material	1332-21-4	0.1	g	----	<0.1	<0.1	----	----
Fibrous Asbestos	----	0.002	g	----	<0.002	<0.002	----	----
Asbestos Containing Material (as 15% Asbestos in ACM >7mm)	1332-21-4	0.01	%	----	<0.01	<0.01	----	----
Asbestos Fines and Fibrous Asbestos (<7mm)	1332-21-4	0.001	%	----	<0.002	<0.002	----	----
Trace Asbestos Detected	----	5	Fibres	----	No	No	----	----
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	----	<5	----
Arsenic	7440-38-2	5	mg/kg	<5	5	----	9	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	<1	----
Chromium	7440-47-3	2	mg/kg	5	4	----	8	----
Copper	7440-50-8	5	mg/kg	11	15	----	10	----
Lead	7439-92-1	5	mg/kg	11	15	----	14	----
Nickel	7440-02-0	2	mg/kg	<2	8	----	7	----
Zinc	7440-66-6	5	mg/kg	23	34	----	27	----
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	<0.1	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	----	<0.5	----	<0.5	----
Isopropylbenzene	98-82-8	0.5	mg/kg	----	<0.5	----	<0.5	----
n-Propylbenzene	103-65-1	0.5	mg/kg	----	<0.5	----	<0.5	----
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	----	<0.5	----	<0.5	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	----	<0.5	----	<0.5	----
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	----	<0.5	----	<0.5	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	----	<0.5	----	<0.5	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				T_111113_01_GP	MD_MW03_0.3	MD_MW02_0.5	MD_MW02_1.0	----
				11-NOV-2013 15:00	11-NOV-2013 15:00	11-NOV-2013 15:00	11-NOV-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1324471-001	ES1324471-002	ES1324471-005	ES1324471-006	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons - Continued</b>								
p-Isopropyltoluene	99-87-6	0.5	mg/kg	----	<0.5	----	<0.5	----
n-Butylbenzene	104-51-8	0.5	mg/kg	----	<0.5	----	<0.5	----
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	----	<5	----	<5	----
2-Butanone (MEK)	78-93-3	5	mg/kg	----	<5	----	<5	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	----	<5	----	<5	----
2-Hexanone (MBK)	591-78-6	5	mg/kg	----	<5	----	<5	----
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	----	<0.5	----	<0.5	----
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	----	<0.5	----	<0.5	----
1,2-Dichloropropane	78-87-5	0.5	mg/kg	----	<0.5	----	<0.5	----
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	----	<0.5	----	<0.5	----
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	----	<0.5	----	<0.5	----
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	----	<0.5	----	<0.5	----
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	----	<5	----	<5	----
Chloromethane	74-87-3	5	mg/kg	----	<5	----	<5	----
Vinyl chloride	75-01-4	5	mg/kg	----	<5	----	<5	----
Bromomethane	74-83-9	5	mg/kg	----	<5	----	<5	----
Chloroethane	75-00-3	5	mg/kg	----	<5	----	<5	----
Trichlorofluoromethane	75-69-4	5	mg/kg	----	<5	----	<5	----
1,1-Dichloroethene	75-35-4	0.5	mg/kg	----	<0.5	----	<0.5	----
Iodomethane	74-88-4	0.5	mg/kg	----	<0.5	----	<0.5	----
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	----	<0.5	----	<0.5	----
1,1-Dichloroethane	75-34-3	0.5	mg/kg	----	<0.5	----	<0.5	----
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	----	<0.5	----	<0.5	----
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	----	<0.5	----	<0.5	----
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	----	<0.5	----	<0.5	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg	----	<0.5	----	<0.5	----
1,2-Dichloroethane	107-06-2	0.5	mg/kg	----	<0.5	----	<0.5	----
Trichloroethene	79-01-6	0.5	mg/kg	----	<0.5	----	<0.5	----
Dibromomethane	74-95-3	0.5	mg/kg	----	<0.5	----	<0.5	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				T_111113_01_GP	MD_MW03_0.3	MD_MW02_0.5	MD_MW02_1.0	----
				11-NOV-2013 15:00	11-NOV-2013 15:00	11-NOV-2013 15:00	11-NOV-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1324471-001	ES1324471-002	ES1324471-005	ES1324471-006	----
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	----	<0.5	----	<0.5	----
1.3-Dichloropropane	142-28-9	0.5	mg/kg	----	<0.5	----	<0.5	----
Tetrachloroethene	127-18-4	0.5	mg/kg	----	<0.5	----	<0.5	----
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	----	<0.5	----	<0.5	----
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	----	<0.5	----	<0.5	----
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	----	<0.5	----	<0.5	----
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	----	<0.5	----	<0.5	----
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	----	<0.5	----	<0.5	----
Pentachloroethane	76-01-7	0.5	mg/kg	----	<0.5	----	<0.5	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	----	<0.5	----	<0.5	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg	----	<0.5	----	<0.5	----
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	----	<0.5	----	<0.5	----
Bromobenzene	108-86-1	0.5	mg/kg	----	<0.5	----	<0.5	----
2-Chlorotoluene	95-49-8	0.5	mg/kg	----	<0.5	----	<0.5	----
4-Chlorotoluene	106-43-4	0.5	mg/kg	----	<0.5	----	<0.5	----
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	----	<0.5	----	<0.5	----
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	----	<0.5	----	<0.5	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	----	<0.5	----	<0.5	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	----	<0.5	----	<0.5	----
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	----	<0.5	----	<0.5	----
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	----	<0.5	----	<0.5	----
Bromodichloromethane	75-27-4	0.5	mg/kg	----	<0.5	----	<0.5	----
Dibromochloromethane	124-48-1	0.5	mg/kg	----	<0.5	----	<0.5	----
Bromoform	75-25-2	0.5	mg/kg	----	<0.5	----	<0.5	----
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	5	mg/kg	----	<5	----	<5	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	----	<1	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				T_111113_01_GP	MD_MW03_0.3	MD_MW02_0.5	MD_MW02_1.0	----
				11-NOV-2013 15:00	11-NOV-2013 15:00	11-NOV-2013 15:00	11-NOV-2013 15:00	----
				ES1324471-001	ES1324471-002	ES1324471-005	ES1324471-006	----
Compound	CAS Number	LOR	Unit					
<b>EP075(SIM)A: Phenolic Compounds - Continued</b>								
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	----	<2	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	----	<b>0.6</b>	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	----	<b>1.2</b>	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	----	<10	----
C10 - C14 Fraction	----	50	mg/kg	<50	<50	----	<50	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	----	<100	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	----	<100	----





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				T_111113_01_GP	MD_MW03_0.3	MD_MW02_0.5	MD_MW02_1.0	----
				11-NOV-2013 15:00	11-NOV-2013 15:00	11-NOV-2013 15:00	11-NOV-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1324471-001	ES1324471-002	ES1324471-005	ES1324471-006	----
<b>EP080/071: Total Petroleum Hydrocarbons - Continued</b>								
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	----	<50	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	----	<10	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	----	<10	----
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	----	<50	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	----	<100	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	----	<100	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	----	<50	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	----	<50	----
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	<0.2	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	----	<0.2	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	----	<1	----
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	105	----	104	----
Toluene-D8	2037-26-5	0.1	%	----	118	----	115	----
4-Bromofluorobenzene	460-00-4	0.1	%	----	106	----	106	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	100	99.4	----	102	----
2-Chlorophenol-D4	93951-73-6	0.1	%	108	107	----	99.5	----
2,4,6-Tribromophenol	118-79-6	0.1	%	48.4	47.2	----	46.6	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	87.8	87.7	----	88.5	----
Anthracene-d10	1719-06-8	0.1	%	73.4	72.9	----	74.1	----
4-Terphenyl-d14	1718-51-0	0.1	%	71.9	71.7	----	72.5	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	99.7	112	----	110	----



### Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

T_111113_01_GP	MD_MW03_0.3	MD_MW02_0.5	MD_MW02_1.0	----
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Client sampling date / time

11-NOV-2013 15:00	11-NOV-2013 15:00	11-NOV-2013 15:00	11-NOV-2013 15:00	----
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Compound	CAS Number	LOR	Unit	ES1324471-001	ES1324471-002	ES1324471-005	ES1324471-006	----
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#### EP080S: TPH(V)/BTEX Surrogates - Continued

Toluene-D8	2037-26-5	0.1	%	104	109	----	106	----
4-Bromofluorobenzene	460-00-4	0.1	%	107	106	----	106	----

### Analytical Results

#### Descriptive Results

Sub-Matrix: SOIL

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
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#### EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples

EA200: Description	MD_MW03_0.3 - 11-NOV-2013 15:00	Pale grey-brown clay soil with some small grey rocks plus a trace of vegetation
EA200: Description	MD_MW02_0.5 - 11-NOV-2013 15:00	Pale grey-brown clay soil with some small grey rocks plus a trace of vegetation



## Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP074S: VOC Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	64	130
Toluene-D8	2037-26-5	66	136
4-Bromofluorobenzene	460-00-4	60	122
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: ES1324471</b>	<b>Page</b>	<b>: 1 of 15</b>
<b>Client</b>	<b>: ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	<b>: Environmental Division Sydney</b>
<b>Contact</b>	<b>: MR JONATHAN LEKAWSKI</b>	<b>Contact</b>	<b>: Barbara Hanna</b>
<b>Address</b>	<b>: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007</b>	<b>Address</b>	<b>: 277-289 Woodpark Road Smithfield NSW Australia 2164</b>
<b>E-mail</b>	<b>: jonathan.lekawski@erm.com</b>	<b>E-mail</b>	<b>: Barbara.Hanna@alsglobal.com</b>
<b>Telephone</b>	<b>: +61 02 8584 8888</b>	<b>Telephone</b>	<b>: +61 2 8784 8555</b>
<b>Facsimile</b>	<b>: +61 02 8584 8800</b>	<b>Facsimile</b>	<b>: +61 2 8784 8555</b>
<b>Project</b>	<b>: 0207423 SYMPHONY</b>	<b>QC Level</b>	<b>: NEPM 2013 Schedule B(3) and ALS QCS3 requirement</b>
<b>Site</b>	<b>: MT.PIPES</b>	<b>Date Samples Received</b>	<b>: 12-NOV-2013</b>
<b>C-O-C number</b>	<b>: 11733</b>	<b>Issue Date</b>	<b>: 19-NOV-2013</b>
<b>Sampler</b>	<b>: CP</b>	<b>No. of samples received</b>	<b>: 6</b>
<b>Order number</b>	<b>: ----</b>	<b>No. of samples analysed</b>	<b>: 4</b>
<b>Quote number</b>	<b>: SY/278/13 V3</b>		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

#### Signatories

Celine Conceicao  
Christopher Owler  
Pabi Subba

#### Position

Senior Spectroscopist  
Team Leader - Asbestos  
Senior Organic Chemist

#### Accreditation Category

Sydney Inorganics  
Newcastle - Asbestos  
Sydney Organics



### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :  
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
RPD = Relative Percentage Difference  
# = Indicates failed QC



## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EA055: Moisture Content (QC Lot: 3164007)</b>									
ES1324349-078	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	19.2	20.4	6.1	0% - 20%
ES1324471-006	MD_MW02_1.0	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	15.1	14.5	3.7	0% - 50%
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3160938)</b>									
ES1324471-001	T_111113_01_GP	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	5	4	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	11	9	27.5	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	11	9	20.5	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	23	8	99.1	No Limit
ES1324477-012	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	3	3	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	9	8	14.6	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3160939)</b>									
ES1324471-001	T_111113_01_GP	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1324477-012	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3160625)</b>									
ES1324471-002	MD_MW03_0.3	EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074B: Oxygenated Compounds (QC Lot: 3160625)</b>									
ES1324471-002	MD_MW03_0.3	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074B: Oxygenated Compounds (QC Lot: 3160625) - continued</b>									
ES1324471-002	MD_MW03_0.3	EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.0	No Limit
<b>EP074C: Sulfonated Compounds (QC Lot: 3160625)</b>									
ES1324471-002	MD_MW03_0.3	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074D: Fumigants (QC Lot: 3160625)</b>									
ES1324471-002	MD_MW03_0.3	EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3160625)</b>									
ES1324471-002	MD_MW03_0.3	EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.0	No Limit
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3160625)</b>									



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3160625) - continued</b>									
ES1324471-002	MD_MW03_0.3	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074G: Trihalomethanes (QC Lot: 3160625)</b>									
ES1324471-002	MD_MW03_0.3	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074H: Naphthalene (QC Lot: 3160625)</b>									
ES1324471-002	MD_MW03_0.3	EP074: Naphthalene	91-20-3	5	mg/kg	<5	<5	0.0	No Limit
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3155974)</b>									
ES1324459-001	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
		ES1324460-014	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5
EP075(SIM): 2-Chlorophenol	95-57-8			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2-Methylphenol	95-48-7			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2-Nitrophenol	88-75-5			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2,4-Dimethylphenol	105-67-9			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2,4-Dichlorophenol	120-83-2			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2,6-Dichlorophenol	87-65-0			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit		





Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3155974) - continued</b>									
ES1324460-014	Anonymous	EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3155974)</b>									
ES1324459-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
ES1324460-014	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3155973)</b>									
ES1324459-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1324460-014	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3160624)</b>									
ES1324471-002	MD_MW03_0.3	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3164605)</b>									
ES1324471-001	T_111113_01_GP	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3155973)</b>									
ES1324459-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
ES1324460-014	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3160624)</b>									
ES1324471-002	MD_MW03_0.3	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3164605)</b>									
ES1324471-001	T_111113_01_GP	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3160624)</b>									
ES1324471-002	MD_MW03_0.3	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3164605)</b>									
ES1324471-001	T_111113_01_GP	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit



## Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3160938)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	118	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	106	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	107	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	124	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	107	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	113	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	98.0	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	111	81	133	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3160939)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	93.2	66	112	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3160625)</b>									
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	89.8	64	126	
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	91.5	66	128	
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	88.3	63	129	
EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	91.9	63	129	
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	90.6	64	130	
EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	91.4	63	129	
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	90.2	63	129	
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	89.9	62	130	
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	88.5	61	131	
<b>EP074B: Oxygenated Compounds (QCLot: 3160625)</b>									
EP074: Vinyl Acetate	108-05-4	1	mg/kg	----	10 mg/kg	35.0	29.6	156	
		5	mg/kg	<5	----	----	----	----	
EP074: 2-Butanone (MEK)	78-93-3	1	mg/kg	----	10 mg/kg	104	58	136	
		5	mg/kg	<5	----	----	----	----	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	1	mg/kg	----	10 mg/kg	81.1	54	138	
		5	mg/kg	<5	----	----	----	----	
EP074: 2-Hexanone (MBK)	591-78-6	1	mg/kg	----	10 mg/kg	80.6	54	136	
		5	mg/kg	<5	----	----	----	----	
<b>EP074C: Sulfonated Compounds (QCLot: 3160625)</b>									
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	79.3	54	126	
<b>EP074D: Fumigants (QCLot: 3160625)</b>									
EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	80.6	55	133	
EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	92.7	69	127	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074D: Fumigants (QCLot: 3160625) - continued</b>									
EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	91.7	54	124	
EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	82.5	51	125	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	91.5	66	126	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3160625)</b>									
EP074: Dichlorodifluoromethane	75-71-8	1	mg/kg	----	10 mg/kg	41.3	30	148	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloromethane	74-87-3	1	mg/kg	----	10 mg/kg	50.2	41	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Vinyl chloride	75-01-4	1	mg/kg	----	10 mg/kg	76.4	43	147	
		5	mg/kg	<5	----	----	----	----	
EP074: Bromomethane	74-83-9	1	mg/kg	----	10 mg/kg	64.0	47	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloroethane	75-00-3	1	mg/kg	----	10 mg/kg	75.0	49	143	
		5	mg/kg	<5	----	----	----	----	
EP074: Trichlorofluoromethane	75-69-4	1	mg/kg	----	10 mg/kg	76.6	49	135	
		5	mg/kg	<5	----	----	----	----	
EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	79.7	54	126	
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	78.2	43	129	
EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	85.2	62	130	
EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	90.6	66	132	
EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	90.0	66	132	
EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	89.0	62	126	
EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	89.5	64	128	
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	93.7	59	125	
EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	93.9	65	123	
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	91.5	64	120	
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	92.6	65	127	
EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	93.5	70	130	
EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	90.1	72	128	
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	94.6	67	143	
EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	96.2	62	122	
EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	75.7	54	128	
EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	73.7	55	129	
EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	88.6	56	132	
EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	93.8	65	135	
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	96.8	19.8	134	
EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	91.9	53	129	
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	101	48	136	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3160625)</b>									



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3160625) - continued</b>									
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	94.6	70	128	
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	91.0	67	127	
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	92.4	64	130	
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	90.3	62	130	
EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	91.0	63	129	
EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	91.4	63	129	
EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	96.0	66	128	
EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	87.8	54	134	
EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	101	60	132	
<b>EP074G: Trihalomethanes (QCLot: 3160625)</b>									
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	93.7	62	120	
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	95.1	61	121	
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	97.8	63	121	
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	97.9	60	126	
<b>EP074H: Naphthalene (QCLot: 3160625)</b>									
EP074: Naphthalene	91-20-3	0.5	mg/kg	----	1 mg/kg	98.7	63	133	
		5	mg/kg	<5	----	----	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3155974)</b>									
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	109	74	116	
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	106	74	116	
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	104	72	116	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	105	69	123	
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	85.9	60.3	117	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	105	69	117	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	81.8	68	112	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	83.2	73	117	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	85.6	76.4	114	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	86.1	57	111	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	90.3	68.9	112	
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	30.2	3.9	57	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3155974)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	99.6	80	124	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	99.9	77	123	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	112	79	123	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	110	77	123	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	113	79	123	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	110	79	123	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	109	79	123	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3155974) - continued</b>									
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	113	79	125	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	91.4	73	121	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	112	81	123	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	87.0	70	118	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	114	77	123	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	104	76	122	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	96.8	71	113	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	97.6	71.7	113	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	86.0	72.4	114	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3155973)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	115	71	131	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	129	74	138	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	95.4	64	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3160624)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	102	68.4	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3164605)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	112	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3155973)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	110	70	130	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	123	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	
		50	mg/kg	----	150 mg/kg	68.3	63	131	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3160624)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	101	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3164605)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	111	68.4	128	
<b>EP080: BTEXN (QCLot: 3160624)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	101	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	103	62	128	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	99.4	58	118	
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	101	60	120	
	106-42-3								
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	104	60	120	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	101	62	138	
<b>EP080: BTEXN (QCLot: 3164605)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	104	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	114	62	128	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	101	58	118	



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
<b>EP080: BTEXN (QCLot: 3164605) - continued</b>								
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	102	60	120
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	103	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	98.6	62	138

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%) Low High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3160938)</b>							
ES1324471-001	T_111113_01_GP	EG005T: Arsenic	7440-38-2	50 mg/kg	97.3	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	105	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	104	70	130
		EG005T: Copper	7440-50-8	125 mg/kg	108	70	130
		EG005T: Lead	7439-92-1	125 mg/kg	104	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	106	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	101	70	130
		EG005T: Zinc	7440-66-6	125 mg/kg	92.2	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3160939)</b>							
ES1324471-001	T_111113_01_GP	EG035T: Mercury	7439-97-6	5 mg/kg	108	70	130
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3160625)</b>							
ES1324471-002	MD_MW03_0.3	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	98.2	70	130
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	97.3	70	130
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3160625)</b>							
ES1324471-002	MD_MW03_0.3	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	98.6	70	130
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3155974)</b>							
ES1324459-001	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	104	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	96.4	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	81.8	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	73.9	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	65.3	20	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3155974)</b>							
ES1324459-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	97.5	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	99.7	70	130





Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%) MS	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3155973)</b>							
ES1324459-001	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	81.0	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	82.5	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	72.2	52	132
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3160624)</b>							
ES1324471-002	MD_MW03_0.3	EP080: C6 - C9 Fraction	----	32.5 mg/kg	107	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3164605)</b>							
ES1324471-001	T_111113_01_GP	EP080: C6 - C9 Fraction	----	32.5 mg/kg	96.2	70	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3155973)</b>							
ES1324459-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	103	73	137
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	75.9	53	131
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	55.3	52	132
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3160624)</b>							
ES1324471-002	MD_MW03_0.3	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	104	70	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3164605)</b>							
ES1324471-001	T_111113_01_GP	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	95.2	70	130
<b>EP080: BTEXN (QCLot: 3160624)</b>							
ES1324471-002	MD_MW03_0.3	EP080: Benzene	71-43-2	2.5 mg/kg	96.9	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	98.4	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	98.5	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	97.5	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	101	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	98.3	70	130
<b>EP080: BTEXN (QCLot: 3164605)</b>							
ES1324471-001	T_111113_01_GP	EP080: Benzene	71-43-2	2.5 mg/kg	71.9	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	82.8	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	86.3	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	86.2	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	84.9	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	83.3	70	130

**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report**

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**





Sub-Matrix: SOIL

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
					MS	MSD	Low	High	Value	Control Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3155973)</b>											
ES1324459-001	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	81.0	----	73	137	----	----	
		EP071: C15 - C28 Fraction	----	3140 mg/kg	82.5	----	53	131	----	----	
		EP071: C29 - C36 Fraction	----	2860 mg/kg	72.2	----	52	132	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3155973)</b>											
ES1324459-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	103	----	73	137	----	----	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	75.9	----	53	131	----	----	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	55.3	----	52	132	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3155974)</b>											
ES1324459-001	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	104	----	70	130	----	----	
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	96.4	----	70	130	----	----	
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	81.8	----	60	130	----	----	
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	73.9	----	70	130	----	----	
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	65.3	----	20	130	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3155974)</b>											
ES1324459-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	97.5	----	70	130	----	----	
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	99.7	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3160624)</b>											
ES1324471-002	MD_MW03_0.3	EP080: C6 - C9 Fraction	----	32.5 mg/kg	107	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3160624)</b>											
ES1324471-002	MD_MW03_0.3	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	104	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3160624)</b>											
ES1324471-002	MD_MW03_0.3	EP080: Benzene	71-43-2	2.5 mg/kg	96.9	----	70	130	----	----	
		EP080: Toluene	108-88-3	2.5 mg/kg	98.4	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	98.5	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	97.5	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	101	----	70	130	----	----	
		EP080: Naphthalene	91-20-3	2.5 mg/kg	98.3	----	70	130	----	----	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3160625)</b>											
ES1324471-002	MD_MW03_0.3	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	98.2	----	70	130	----	----	
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	97.3	----	70	130	----	----	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3160625)</b>											
ES1324471-002	MD_MW03_0.3	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	98.6	----	70	130	----	----	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3160938)</b>											
ES1324471-001	T_111113_01_GP	EG005T: Arsenic	7440-38-2	50 mg/kg	97.3	----	70	130	----	----	
		EG005T: Cadmium	7440-43-9	50 mg/kg	105	----	70	130	----	----	
		EG005T: Chromium	7440-47-3	50 mg/kg	104	----	70	130	----	----	



Sub-Matrix: SOIL

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>EG005T: Total Metals by ICP-AES (QCLot: 3160938) - continued</b>										
ES1324471-001	T_111113_01_GP	EG005T: Copper	7440-50-8	125 mg/kg	108	----	70	130	----	----
		EG005T: Lead	7439-92-1	125 mg/kg	104	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	106	----	70	130	----	----
		EG005T: Selenium	7782-49-2	50 mg/kg	101	----	70	130	----	----
		EG005T: Zinc	7440-66-6	125 mg/kg	92.2	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3160939)</b>										
ES1324471-001	T_111113_01_GP	EG035T: Mercury	7439-97-6	5 mg/kg	108	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3164605)</b>										
ES1324471-001	T_111113_01_GP	EP080: C6 - C9 Fraction	----	32.5 mg/kg	96.2	----	70	130	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3164605)</b>										
ES1324471-001	T_111113_01_GP	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	95.2	----	70	130	----	----
<b>EP080: BTEXN (QCLot: 3164605)</b>										
ES1324471-001	T_111113_01_GP	EP080: Benzene	71-43-2	2.5 mg/kg	71.9	----	70	130	----	----
		EP080: Toluene	108-88-3	2.5 mg/kg	82.8	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	86.3	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	86.2	----	70	130	----	----
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	84.9	----	70	130	----	----
		EP080: Naphthalene	91-20-3	2.5 mg/kg	83.3	----	70	130	----	----

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1324471</b>	Page	: 1 of 6
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: 0207423 SYMPHONY	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: MT.PIPES	Date Samples Received	: 12-NOV-2013
C-O-C number	: 11733	Issue Date	: 19-NOV-2013
Sampler	: CP	No. of samples received	: 6
Order number	: ----	No. of samples analysed	: 4
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EA055: Moisture Content</b>								
Soil Glass Jar - Unpreserved (EA055-103) T_111113_01_GP, MD_MW02_1.0	MD_MW03_0.3	11-NOV-2013	----	----	----	18-NOV-2013	25-NOV-2013	✓
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Snap Lock Bag (EA200) MD_MW03_0.3,	MD_MW02_0.5	11-NOV-2013	---	10-MAY-2014	----	18-NOV-2013	17-MAY-2014	✓
<b>EG005T: Total Metals by ICP-AES</b>								
Soil Glass Jar - Unpreserved (EG005T) T_111113_01_GP, MD_MW02_1.0	MD_MW03_0.3,	11-NOV-2013	15-NOV-2013	10-MAY-2014	✓	15-NOV-2013	10-MAY-2014	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Soil Glass Jar - Unpreserved (EG035T) T_111113_01_GP, MD_MW02_1.0	MD_MW03_0.3,	11-NOV-2013	15-NOV-2013	09-DEC-2013	✓	18-NOV-2013	09-DEC-2013	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
Soil Glass Jar - Unpreserved (EP071) T_111113_01_GP, MD_MW02_1.0	MD_MW03_0.3,	11-NOV-2013	15-NOV-2013	25-NOV-2013	✓	15-NOV-2013	25-DEC-2013	✓
<b>EP074D: Fumigants</b>								
Soil Glass Jar - Unpreserved (EP074) MD_MW03_0.3,	MD_MW02_1.0	11-NOV-2013	15-NOV-2013	18-NOV-2013	✓	15-NOV-2013	18-NOV-2013	✓
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Soil Glass Jar - Unpreserved (EP074) MD_MW03_0.3,	MD_MW02_1.0	11-NOV-2013	15-NOV-2013	18-NOV-2013	✓	15-NOV-2013	18-NOV-2013	✓
<b>EP074F: Halogenated Aromatic Compounds</b>								
Soil Glass Jar - Unpreserved (EP074) MD_MW03_0.3,	MD_MW02_1.0	11-NOV-2013	15-NOV-2013	18-NOV-2013	✓	15-NOV-2013	18-NOV-2013	✓
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Soil Glass Jar - Unpreserved (EP074) MD_MW03_0.3,	MD_MW02_1.0	11-NOV-2013	15-NOV-2013	18-NOV-2013	✓	15-NOV-2013	18-NOV-2013	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP074H: Naphthalene</b>								
Soil Glass Jar - Unpreserved (EP074) MD_MW03_0.3, MD_MW02_1.0	11-NOV-2013	15-NOV-2013	18-NOV-2013	✓	15-NOV-2013	18-NOV-2013	✓	
<b>EP074B: Oxygenated Compounds</b>								
Soil Glass Jar - Unpreserved (EP074) MD_MW03_0.3, MD_MW02_1.0	11-NOV-2013	15-NOV-2013	18-NOV-2013	✓	15-NOV-2013	18-NOV-2013	✓	
<b>EP074C: Sulfonated Compounds</b>								
Soil Glass Jar - Unpreserved (EP074) MD_MW03_0.3, MD_MW02_1.0	11-NOV-2013	15-NOV-2013	18-NOV-2013	✓	15-NOV-2013	18-NOV-2013	✓	
<b>EP074G: Trihalomethanes</b>								
Soil Glass Jar - Unpreserved (EP074) MD_MW03_0.3, MD_MW02_1.0	11-NOV-2013	15-NOV-2013	18-NOV-2013	✓	15-NOV-2013	18-NOV-2013	✓	
<b>EP075(SIM)A: Phenolic Compounds</b>								
Soil Glass Jar - Unpreserved (EP075(SIM)) T_111113_01_GP, MD_MW03_0.3, MD_MW02_1.0	11-NOV-2013	15-NOV-2013	25-NOV-2013	✓	15-NOV-2013	25-DEC-2013	✓	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Soil Glass Jar - Unpreserved (EP075(SIM)) T_111113_01_GP, MD_MW03_0.3, MD_MW02_1.0	11-NOV-2013	15-NOV-2013	25-NOV-2013	✓	15-NOV-2013	25-DEC-2013	✓	
<b>EP080: BTEXN</b>								
Soil Glass Jar - Unpreserved (EP080) MD_MW03_0.3, MD_MW02_1.0	11-NOV-2013	15-NOV-2013	25-NOV-2013	✓	15-NOV-2013	25-NOV-2013	✓	
Soil Glass Jar - Unpreserved (EP080) T_111113_01_GP	11-NOV-2013	18-NOV-2013	25-NOV-2013	✓	18-NOV-2013	25-NOV-2013	✓	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
Soil Glass Jar - Unpreserved (EP080) MD_MW03_0.3, MD_MW02_1.0	11-NOV-2013	15-NOV-2013	25-NOV-2013	✓	15-NOV-2013	25-NOV-2013	✓	
Soil Glass Jar - Unpreserved (EP080) T_111113_01_GP	11-NOV-2013	18-NOV-2013	25-NOV-2013	✓	18-NOV-2013	25-NOV-2013	✓	



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Moisture Content	EA055-103	2	20	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	20	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	20	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	20	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	20	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	8	25.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	5	20.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	8	25.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	5	20.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	8	25.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	5	20.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	8	25.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	5	20.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Asbestos Identification in bulk solids	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples
Asbestos - Quantitative Analysis	* EA200C	SOIL	Asbestos Materials Content with Confirmation of Identification by AS 4964 - 2004 Asbestos
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (2013) Schedule B(3) (Method 506.1)
Volatile Organic Compounds	EP074	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.



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## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### **Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes**

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.
- For all matrices, no Matrix Spike outliers occur.

#### **Regular Sample Surrogates**

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- No Analysis Holding Time Outliers exist.

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.
-



## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

<b>Work Order</b> : <b>ES1324471</b>	
<b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : MR JONATHAN LEKAWSKI <b>Address</b> : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Laboratory</b> : Environmental Division Sydney  <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b> : jonathan.lekawski@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800	<b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555
<b>Project</b> : 0207423 SYMPHONY <b>Order number</b> : ---- <b>C-O-C number</b> : 11733 <b>Site</b> : MT.PIPES <b>Sampler</b> : CP	<b>Page</b> : 1 of 2  <b>Quote number</b> : ES2013ENVRES0370 (SY/278/13 V3)  <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement

#### Dates

<b>Date Samples Received</b> : 12-NOV-2013 <b>Client Requested Due Date</b> : 19-NOV-2013	<b>Issue Date</b> : 13-NOV-2013 11:22 <b>Scheduled Reporting Date</b> : <b>19-NOV-2013</b>
--	---

#### Delivery Details

<b>Mode of Delivery</b> : Carrier <b>No. of coolers/boxes</b> : 1 HARD <b>Security Seal</b> : Not intact.	<b>Temperature</b> : 8.3°C - Ice present <b>No. of samples received</b> : 6 <b>No. of samples analysed</b> : 4
---	--

#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Asbestos analysis will be conducted by ALS Newcastle.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA200N Asbestos Quantitation by WANEPM Guidelines -	SOIL - EGO05T (solids) Total Metals by ICP-AES	SOIL - EP074 (solids) Volatile Organic Compounds	SOIL - S-27 TRHIBTEXNI/PAH/Phenols/8Metals
ES1324471-001	11-NOV-2013 15:00	T_111113_01_GP			✓		✓
ES1324471-002	11-NOV-2013 15:00	MD_MW03_0.3		✓	✓	✓	✓
ES1324471-003	11-NOV-2013 15:00	MD_MW03_0.5	✓				
ES1324471-004	11-NOV-2013 15:00	MD_MW02_0.25	✓				
ES1324471-005	11-NOV-2013 15:00	MD_MW02_0.5		✓			
ES1324471-006	11-NOV-2013 15:00	MD_MW02_1.0			✓	✓	✓

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
 Email jonathan.lekawski@erm.com  
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 Email jonathan.lekawski@erm.com  
 Email jonathan.lekawski@erm.com  
 Email jonathan.lekawski@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email symphony.deltawest@erm.com  
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 Email symphony.deltawest@erm.com  
 Email symphony.deltawest@erm.com  
 Email symphony.deltawest@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com


ERM  
 Sydney  
 Melbourne  
 Brisbane  
 Perth  
 Hunter Valley  
 North Coast  
 Other

Gnd Floor, 33 Saunders Street, Pyrmont, NSW, 2009. (ph) 02 8584 8888 (fax) 02 8584 8800  
 Level 3, Yarra Tower, WTC, 18-38 Stadelcy Street, Docklands, VIC, 3005. (ph) 03 9696 8011 (fax) 03 9696 8022  
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 Level 6, Grain Pool Bld, 172 St Georges Tce, WA, 6050. (ph) 08 9321 5200 (fax) 08 9321 5262  
 53 Bonville Avenue, Thornton, NSW, 2322. (ph) 02 4964 2150 (fax) 02 4964 2152  
 Suite 3/146 Gordon Street, Port Macquarie, NSW, 2444. (ph) 02 6564 7155 (fax) 02 6564 7160

Project No: 0207925  
 Project Name: Sampling  
 Project Location: Mt. Piper  
 Project Manager: Jonathan Lekawski  
 Sampler: Gavin Powell

COC Number  
**A 11733**  
 Laboratory  
**ALS**

Laboratory Number	Sample ID	Sample Depth	Sample Date	Sample Time	Matrix		Preservation			Containers (number/type)	Yes (tick)	Other Comments on sample (eg: high voc, highly contaminated, special detection limits etc etc)
					Water	Soil	Other	Ice	Acid			
1	MD-MW02-01-SP		11/11		X			X		1		VOC Scan (USEPA 8260 List) X Speciated TPH X TPH (C10-C9 P & T) + X BTEX X VOC Scan (USEPA 8260 List) X OC OP Pesticides X PAH XX Phenols XX PCB X Metals* (dissolved / total) X *Metals (notes) As Cd Cr Cu Hg Ni Pb Zn
2	MD-MW03-03				X			X		2		VOC Scan (USEPA 8260 List) X Speciated TPH X TPH (C10-C9 P & T) + X BTEX X VOC Scan (USEPA 8260 List) X OC OP Pesticides X PAH XX Phenols XX PCB X Metals* (dissolved / total) X *Metals (notes) As Cd Cr Cu Hg Ni Pb Zn
3	MD-MW03-05				X			X		1		VOC Scan (USEPA 8260 List) X Speciated TPH X TPH (C10-C9 P & T) + X BTEX X VOC Scan (USEPA 8260 List) X OC OP Pesticides X PAH XX Phenols XX PCB X Metals* (dissolved / total) X *Metals (notes) As Cd Cr Cu Hg Ni Pb Zn
4	MD-MW02-025				X			X		1		VOC Scan (USEPA 8260 List) X Speciated TPH X TPH (C10-C9 P & T) + X BTEX X VOC Scan (USEPA 8260 List) X OC OP Pesticides X PAH XX Phenols XX PCB X Metals* (dissolved / total) X *Metals (notes) As Cd Cr Cu Hg Ni Pb Zn
5	MD-MW02-05				X			X		1		VOC Scan (USEPA 8260 List) X Speciated TPH X TPH (C10-C9 P & T) + X BTEX X VOC Scan (USEPA 8260 List) X OC OP Pesticides X PAH XX Phenols XX PCB X Metals* (dissolved / total) X *Metals (notes) As Cd Cr Cu Hg Ni Pb Zn
6	MD-MW02-10				X			X		1		VOC Scan (USEPA 8260 List) X Speciated TPH X TPH (C10-C9 P & T) + X BTEX X VOC Scan (USEPA 8260 List) X OC OP Pesticides X PAH XX Phenols XX PCB X Metals* (dissolved / total) X *Metals (notes) As Cd Cr Cu Hg Ni Pb Zn

Environmental Division  
 Sydney  
 Work Order  
**ES1324471**  
  
 Telephone : +61-2-8784 8555

Comments: quote SA/278/13, email [symphony.della-west@erm.com](mailto:symphony.della-west@erm.com)  
 Relinquished by: [Signature]  
 Date/Time: 12/11 0830  
 Relinquished by: [Signature]  
 Date/Time: [Signature]

## CERTIFICATE OF ANALYSIS

Work Order	: <b>ES1324472</b>	Page	: 1 of 13
Client	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: PROJECT SYMPHONY-MP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 0207423	Date Samples Received	: 12-NOV-2013
C-O-C number	: ----	Issue Date	: 22-NOV-2013
Sampler	: TS/GP	No. of samples received	: 12
Site	: ----	No. of samples analysed	: 7
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EA150H: Soil Particle Density required for Hydrometer analysis according to AS 1289.3.5.1-2006 was not requested by the client. Typical sediment SPD values used for calculations and consequently NATA endorsement does not apply to hydrometer results.**
- **EA200 Legend**
- **EA200 'Am' Amosite (brown asbestos)**
- **EA200 'Ch' Chrysotile (white asbestos)**
- **EA200 'Cr' Crocidolite (blue asbestos)**
- **EA200 'Trace' - Asbestos fibres detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres**
- **EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.**
- **EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.**
- **EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.**
- **EP080: The TRIP SPIKE and TRIP SPIKE CONTROL have been analysed for volatile TPH and BTEX only. The TRIP SPIKE and TRIP SPIKE CONTROL were prepared in the lab using reagent grade sand spiked with petrol. The TRIP SPIKE was dispatched from the lab and the TRIP SPIKE CONTROL retained. The spike samples were extracted and analysed concurrently with samples reported in this batch.**



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

## Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Hamish Murray	Supervisor - Soils	Newcastle - Inorganics
Hoa Nguyen	Senior Inorganic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Organics
Shaun Spooner	Laboratory Technician	Newcastle - Asbestos
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK-SB03-0.5	TRIP BLANK	TRIP SPIKE (14)	MK-SB08-0.2	MK-SB01-0.2
				08-NOV-2013 08:40	04-NOV-2013 15:00	30-OCT-2013 15:00	08-NOV-2013 09:50	08-NOV-2013 11:10
Compound	CAS Number	LOR	Unit	ES1324472-002	ES1324472-004	ES1324472-005	ES1324472-006	ES1324472-009
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	10.2	----	----	15.6	16.1
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	----	----	No	No
Asbestos Type	1332-21-4	0.1	--	-	----	----	-	-
Sample weight (dry)	----	0.01	g	200	----	----	177	145
APPROVED IDENTIFIER:	----	-	--	S.SPOONER	----	----	S.SPOONER	S.SPOONER
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	----	----	<5	<5
Arsenic	7440-38-2	5	mg/kg	<5	----	----	6	7
Cadmium	7440-43-9	1	mg/kg	<1	----	----	<1	<1
Chromium	7440-47-3	2	mg/kg	<2	----	----	5	8
Copper	7440-50-8	5	mg/kg	<5	----	----	8	11
Lead	7439-92-1	5	mg/kg	10	----	----	12	13
Nickel	7440-02-0	2	mg/kg	4	----	----	13	16
Zinc	7440-66-6	5	mg/kg	31	----	----	46	39
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	<0.1	<0.1
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	----	----	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	----	----	<2	<2
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	----	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK-SB03-0.5	TRIP BLANK	TRIP SPIKE (14)	MK-SB08-0.2	MK-SB01-0.2
				08-NOV-2013 08:40	04-NOV-2013 15:00	30-OCT-2013 15:00	08-NOV-2013 09:50	08-NOV-2013 11:10
Compound	CAS Number	LOR	Unit	ES1324472-002	ES1324472-004	ES1324472-005	ES1324472-006	ES1324472-009
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	----	----	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	----	----	<b>0.6</b>	<b>0.6</b>
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	----	----	<b>1.2</b>	<b>1.2</b>
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<b>61</b>	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	----	----	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	----	----	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	----	----	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<b>71</b>	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<b>40</b>	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	----	----	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	----	----	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	----	----	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	----	----	<50	<50



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK-SB03-0.5	TRIP BLANK	TRIP SPIKE (14)	MK-SB08-0.2	MK-SB01-0.2
				08-NOV-2013 08:40	04-NOV-2013 15:00	30-OCT-2013 15:00	08-NOV-2013 09:50	08-NOV-2013 11:10
Compound	CAS Number	LOR	Unit	ES1324472-002	ES1324472-004	ES1324472-005	ES1324472-006	ES1324472-009
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.4	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	15.6	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	1.9	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	9.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	3.8	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	31.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	13.3	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	84.4	----	----	84.9	84.3
2-Chlorophenol-D4	93951-73-6	0.1	%	86.0	----	----	90.6	89.5
2,4,6-Tribromophenol	118-79-6	0.1	%	72.7	----	----	78.6	72.5
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	85.4	----	----	90.8	85.9
Anthracene-d10	1719-06-8	0.1	%	80.3	----	----	87.3	81.1
4-Terphenyl-d14	1718-51-0	0.1	%	84.6	----	----	93.2	85.3
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	81.1	104	103	97.9	97.4
Toluene-D8	2037-26-5	0.1	%	88.5	105	110	97.2	97.1
4-Bromofluorobenzene	460-00-4	0.1	%	90.3	102	103	97.7	100





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				ML-MW07-0.2	TSC	---	---	---
				08-NOV-2013 12:40	30-OCT-2013 15:00	---	---	---
Compound	CAS Number	LOR	Unit	ES1324472-010	ES1324472-012	---	---	---
<b>EA150: Particle Sizing</b>								
+75µm	---	1	%	65	---	---	---	---
+150µm	---	1	%	59	---	---	---	---
+300µm	---	1	%	53	---	---	---	---
+425µm	---	1	%	48	---	---	---	---
+600µm	---	1	%	43	---	---	---	---
+1180µm	---	1	%	34	---	---	---	---
+2.36mm	---	1	%	28	---	---	---	---
+4.75mm	---	1	%	23	---	---	---	---
+9.5mm	---	1	%	18	---	---	---	---
+19.0mm	---	1	%	14	---	---	---	---
+37.5mm	---	1	%	8	---	---	---	---
+75.0mm	---	1	%	<1	---	---	---	---
<b>EA002 : pH (Soils)</b>								
pH Value	---	0.1	pH Unit	4.6	---	---	---	---
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	---	1.0	%	15.4	---	---	---	---
<b>EA150: Soil Classification based on Particle Size</b>								
Clay (<2 µm)	---	1	%	18	---	---	---	---
Silt (2-60 µm)	---	1	%	16	---	---	---	---
Sand (0.06-2.00 mm)	---	1	%	38	---	---	---	---
Gravel (>2mm)	---	1	%	28	---	---	---	---
Cobbles (>6cm)	---	1	%	<1	---	---	---	---
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	---	---	---	---
Asbestos Type	1332-21-4	0.1	--	-	---	---	---	---
Sample weight (dry)	---	0.01	g	150	---	---	---	---
APPROVED IDENTIFIER:	---	-	--	S.SPOONER	---	---	---	---
<b>ED008: Exchangeable Cations</b>								
Exchangeable Calcium	---	0.1	meq/100g	2.2	---	---	---	---
Exchangeable Magnesium	---	0.1	meq/100g	2.0	---	---	---	---
Exchangeable Potassium	---	0.1	meq/100g	0.2	---	---	---	---
Exchangeable Sodium	---	0.1	meq/100g	<0.1	---	---	---	---
Cation Exchange Capacity	---	0.1	meq/100g	4.4	---	---	---	---



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				ML-MW07-0.2	TSC	---	---	---
				08-NOV-2013 12:40	30-OCT-2013 15:00	---	---	---
Compound	CAS Number	LOR	Unit	ES1324472-010	ES1324472-012	---	---	---
<b>ED008: Exchangeable Cations - Continued</b>								
Exchangeable Sodium Percent	---	0.1	%	1.2	---	---	---	---
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	---	---	---	---
Arsenic	7440-38-2	5	mg/kg	5	---	---	---	---
Cadmium	7440-43-9	1	mg/kg	<1	---	---	---	---
Chromium	7440-47-3	2	mg/kg	6	---	---	---	---
Copper	7440-50-8	5	mg/kg	14	---	---	---	---
Lead	7439-92-1	5	mg/kg	16	---	---	---	---
Nickel	7440-02-0	2	mg/kg	12	---	---	---	---
Zinc	7440-66-6	5	mg/kg	23	---	---	---	---
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	---	---	---	---
<b>EP004: Organic Matter</b>								
Organic Matter	---	0.5	%	3.0	---	---	---	---
Total Organic Carbon	---	0.5	%	1.8	---	---	---	---
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	---	0.1	mg/kg	<0.1	---	---	---	---
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	<0.5	---	---	---	---
Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	---	---	---	---
n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	---	---	---	---
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	---	---	---	---
sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	---	---	---	---
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	---	---	---	---
tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	---	---	---	---
p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	---	---	---	---
n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	---	---	---	---
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	<5	---	---	---	---
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	---	---	---	---
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	---	---	---	---
2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	---	---	---	---
<b>EP074C: Sulfonated Compounds</b>								



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				ML-MW07-0.2	TSC	---	---	---
				08-NOV-2013 12:40	30-OCT-2013 15:00	---	---	---
				ES1324472-010	ES1324472-012	---	---	---
Compound	CAS Number	LOR	Unit					
<b>EP074C: Sulfonated Compounds - Continued</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	---	---	---	---
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	---	---	---	---
1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	---	---	---	---
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	---	---	---	---
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	---	---	---	---
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	---	---	---	---
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	---	---	---	---
Chloromethane	74-87-3	5	mg/kg	<5	---	---	---	---
Vinyl chloride	75-01-4	5	mg/kg	<5	---	---	---	---
Bromomethane	74-83-9	5	mg/kg	<5	---	---	---	---
Chloroethane	75-00-3	5	mg/kg	<5	---	---	---	---
Trichlorofluoromethane	75-69-4	5	mg/kg	<5	---	---	---	---
1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	---	---	---	---
Iodomethane	74-88-4	0.5	mg/kg	<0.5	---	---	---	---
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	---	---	---	---
1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	---	---	---	---
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	---	---	---	---
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	---	---	---	---
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	---	---	---	---
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	---	---	---	---
1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	---	---	---	---
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	---	---	---	---
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	---	---	---	---
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	---	---	---	---
1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	---	---	---	---
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	---	---	---	---
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	---	---	---	---
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	---	---	---	---
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	---	---	---	---
1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	---	---	---	---
1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	---	---	---	---
Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	---	---	---	---



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sample ID	ML-MW07-0.2	TSC			
08-NOV-2013 12:40		30-OCT-2013 15:00			

Client sampling date / time

Compound	CAS Number	LOR	Unit	ES1324472-010	ES1324472-012			
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### EP074E: Halogenated Aliphatic Compounds - Continued

1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	----	----	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	----	----	----	----

### EP074F: Halogenated Aromatic Compounds

Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	----	----	----	----
Bromobenzene	108-86-1	0.5	mg/kg	<0.5	----	----	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	----	----	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	----	----	----	----
1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	----	----	----	----
1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	----	----	----	----
1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	----	----	----	----
1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	----	----	----	----
1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	----	----	----	----

### EP074G: Trihalomethanes

Chloroform	67-66-3	0.5	mg/kg	<0.5	----	----	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	----	----	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	----	----	----	----
Bromoform	75-25-2	0.5	mg/kg	<0.5	----	----	----	----

### EP074H: Naphthalene

Naphthalene	91-20-3	5	mg/kg	<5	----	----	----	----
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### EP075(SIM)A: Phenolic Compounds

Phenol	108-95-2	0.5	mg/kg	<0.5	----	----	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	----	----	----	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	----	----	----	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	----	----	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	----	----	----	----
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	----	----	----	----
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	----	----	----	----
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	----	----	----	----
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	----	----	----	----
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	----	----	----	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	----	----	----	----

### EP075(SIM)B: Polynuclear Aromatic Hydrocarbons



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sample ID	ML-MW07-0.2	TSC	---	---	---
08-NOV-2013 12:40		30-OCT-2013 15:00	---	---	---
ES1324472-010	ES1324472-012		---	---	---

Client sampling date / time

Compound	CAS Number	LOR	Unit	ES1324472-010	ES1324472-012	---	---	---
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### EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued

Naphthalene	91-20-3	0.5	mg/kg	<0.5	---	---	---	---
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	---	---	---	---
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	---	---	---	---
Fluorene	86-73-7	0.5	mg/kg	<0.5	---	---	---	---
Phenanthrene	85-01-8	0.5	mg/kg	1.0	---	---	---	---
Anthracene	120-12-7	0.5	mg/kg	<0.5	---	---	---	---
Fluoranthene	206-44-0	0.5	mg/kg	0.5	---	---	---	---
Pyrene	129-00-0	0.5	mg/kg	<0.5	---	---	---	---
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	---	---	---	---
Chrysene	218-01-9	0.5	mg/kg	<0.5	---	---	---	---
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	---	---	---	---
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	---	---	---	---
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	---	---	---	---
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	---	---	---	---
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	---	---	---	---
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	---	---	---	---
^ Sum of polycyclic aromatic hydrocarbons	---	0.5	mg/kg	1.5	---	---	---	---
^ Benzo(a)pyrene TEQ (zero)	---	0.5	mg/kg	<0.5	---	---	---	---
^ Benzo(a)pyrene TEQ (half LOR)	---	0.5	mg/kg	0.6	---	---	---	---
^ Benzo(a)pyrene TEQ (LOR)	---	0.5	mg/kg	1.2	---	---	---	---

### EP080/071: Total Petroleum Hydrocarbons

C6 - C9 Fraction	---	10	mg/kg	<10	101	---	---	---
C10 - C14 Fraction	---	50	mg/kg	<50	---	---	---	---
C15 - C28 Fraction	---	100	mg/kg	<100	---	---	---	---
C29 - C36 Fraction	---	100	mg/kg	<100	---	---	---	---
^ C10 - C36 Fraction (sum)	---	50	mg/kg	<50	---	---	---	---

### EP080/071: Total Recoverable Hydrocarbons - NEPM 2013

C6 - C10 Fraction	C6_C10	10	mg/kg	<10	111	---	---	---
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	69	---	---	---
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	---	---	---	---
>C16 - C34 Fraction	---	100	mg/kg	<100	---	---	---	---
>C34 - C40 Fraction	---	100	mg/kg	<100	---	---	---	---
^ >C10 - C40 Fraction (sum)	---	50	mg/kg	<50	---	---	---	---



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

ML-MW07-0.2

TSC

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Client sampling date / time

08-NOV-2013 12:40

30-OCT-2013 15:00

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Compound	CAS Number	LOR	Unit	ES1324472-010	ES1324472-012	---	---	---
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 - Continued</b>								
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	----	----	----	----
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<b>0.9</b>	----	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<b>22.3</b>	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<b>2.4</b>	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<b>12.1</b>	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<b>4.7</b>	----	----	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<b>42.4</b>	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<b>16.8</b>	----	----	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	----	----	----
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	<b>63.2</b>	----	----	----	----
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	<b>103</b>	----	----	----	----
Toluene-D8	2037-26-5	0.1	%	<b>111</b>	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	<b>104</b>	----	----	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	<b>84.1</b>	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	<b>89.7</b>	----	----	----	----
2,4,6-Tribromophenol	118-79-6	0.1	%	<b>76.6</b>	----	----	----	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	<b>89.3</b>	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%	<b>81.2</b>	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	<b>88.2</b>	----	----	----	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	<b>109</b>	<b>110</b>	----	----	----
Toluene-D8	2037-26-5	0.1	%	<b>102</b>	<b>106</b>	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	<b>102</b>	<b>106</b>	----	----	----



## Analytical Results

### Descriptive Results

Sub-Matrix: **SOIL**

<i>Method: Compound</i>	<i>Client sample ID - Client sampling date / time</i>	<i>Analytical Results</i>
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>		
EA200: Description	MK-SB03-0.5 - 08-NOV-2013 08:40	Pale grey clay soil with dark grey rocks and quartz grains plus a trace of vegetation.
EA200: Description	MK-SB08-0.2 - 08-NOV-2013 09:50	Mid grey - brown clay soil with dark grey and orange rocks with some quartz grains plus a trace of vegetation.
EA200: Description	MK-SB01-0.2 - 08-NOV-2013 11:10	Mid grey - brown clay soil with dark grey and orange rocks with some quartz grains plus a trace of vegetation.
EA200: Description	ML-MW07-0.2 - 08-NOV-2013 12:40	Mid grey - brown clay soil with dark grey and orange rocks with some quartz grains plus a trace of vegetation.



## Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP066S: PCB Surrogate</b>			
Decachlorobiphenyl	2051-24-3	39	149
<b>EP074S: VOC Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	64	130
Toluene-D8	2037-26-5	66	136
4-Bromofluorobenzene	460-00-4	60	122
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0



## QUALITY CONTROL REPORT

Work Order	: <b>ES1324472</b>	Page	: 1 of 16
Client	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: PROJECT SYMPHONY-MP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 12-NOV-2013
C-O-C number	: ----	Issue Date	: 22-NOV-2013
Sampler	: TS/GP	No. of samples received	: 12
Order number	: 0207423	No. of samples analysed	: 7
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :  
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
RPD = Relative Percentage Difference  
# = Indicates failed QC



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

## Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Hamish Murray	Supervisor - Soils	Newcastle - Inorganics
Hoa Nguyen	Senior Inorganic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Organics
Shaun Spooner	Laboratory Technician	Newcastle - Asbestos
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics



## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EA002 : pH (Soils) (QC Lot: 3159420)</b>									
ES1324384-001	Anonymous	EA002: pH Value	----	0.1	pH Unit	7.8	7.8	0.0	0% - 20%
ES1324506-008	Anonymous	EA002: pH Value	----	0.1	pH Unit	9.9	9.9	0.0	0% - 20%
<b>EA055: Moisture Content (QC Lot: 3161257)</b>									
ES1324460-022	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	24.8	22.5	9.6	0% - 20%
ES1324473-005	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	27.7	31.6	13.0	0% - 20%
<b>ED008: Exchangeable Cations (QC Lot: 3161478)</b>									
ES1324472-010	ML-MW07-0.2	ED008: Exchangeable Sodium Percent	----	0.1	%	1.2	1.2	0.0	0% - 20%
		ED008: Exchangeable Calcium	----	0.1	meq/100g	2.2	2.3	0.0	0% - 20%
		ED008: Exchangeable Magnesium	----	0.1	meq/100g	2.0	2.0	0.0	0% - 20%
		ED008: Exchangeable Potassium	----	0.1	meq/100g	0.2	0.2	0.0	0% - 20%
		ED008: Exchangeable Sodium	----	0.1	meq/100g	<0.1	<0.1	0.0	0% - 20%
		ED008: Cation Exchange Capacity	----	0.1	meq/100g	4.4	4.5	0.0	0% - 20%
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3165721)</b>									
ES1324472-002	MK-SB03-0.5	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	4	4	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	10	10	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	31	32	0.0	No Limit
ES1324718-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	14	14	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	10	11	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	15	15	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	16	16	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	43	42	4.2	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3165722)</b>									
ES1324472-002	MK-SB03-0.5	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1324718-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP004: Organic Matter (QC Lot: 3156952)</b>									
ES1324188-004	Anonymous	EP004: Organic Matter	----	0.5	%	3.2	3.2	0.0	No Limit
		EP004: Total Organic Carbon	----	0.5	%	1.8	1.8	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 3156180)</b>									
ES1324476-007	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1324470-019	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3160625)</b>									
ES1324471-002	Anonymous	EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074B: Oxygenated Compounds (QC Lot: 3160625)</b>									
ES1324471-002	Anonymous	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.0	No Limit
<b>EP074C: Sulfonated Compounds (QC Lot: 3160625)</b>									
ES1324471-002	Anonymous	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074D: Fumigants (QC Lot: 3160625)</b>									
ES1324471-002	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3160625)</b>									
ES1324471-002	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3160625) - continued</b>									
ES1324471-002	Anonymous	EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.0	No Limit
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.0	No Limit		
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3160625)</b>									
ES1324471-002	Anonymous	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074G: Trihalomethanes (QC Lot: 3160625)</b>									
ES1324471-002	Anonymous	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074H: Naphthalene (QC Lot: 3160625)</b>									
ES1324471-002	Anonymous	EP074: Naphthalene	91-20-3	5	mg/kg	<5	<5	0.0	No Limit
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3158392)</b>									
ES1324472-002	MK-SB03-0.5	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3158392) - continued</b>									
ES1324472-002	MK-SB03-0.5	EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
ES1324590-001	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
		<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3158392)</b>							
ES1324472-002	MK-SB03-0.5	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1324590-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3158392) - continued</b>									
ES1324590-001	Anonymous	EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3158391)</b>									
ES1324472-002	MK-SB03-0.5	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1324590-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3160623)</b>									
EN1304177-018	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1324586-034	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3160624)</b>									
ES1324471-002	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3158391)</b>									
ES1324472-002	MK-SB03-0.5	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
ES1324590-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	150	170	13.6	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3160623)</b>									
EN1304177-018	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES1324586-034	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3160624)</b>									



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3160624) - continued</b>										
ES1324471-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit	
<b>EP080: BTEXN (QC Lot: 3160623)</b>										
EN1304177-018	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit	
ES1324586-034	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit	
<b>EP080: BTEXN (QC Lot: 3160624)</b>										
ES1324471-002	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit	





## Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>ED008: Exchangeable Cations (QCLot: 3161478)</b>									
ED008: Exchangeable Calcium	----	0.1	meq/100g	<0.1	1 meq/100g	108	90	128	
ED008: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	1.67 meq/100g	101	86	120	
ED008: Exchangeable Potassium	----	0.1	meq/100g	<0.1	0.51 meq/100g	124	85	135	
ED008: Exchangeable Sodium	----	0.1	meq/100g	<0.1	0.87 meq/100g	102	86	128	
ED008: Cation Exchange Capacity	----	0.1	meq/100g	<0.1	----	----	----	----	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3165721)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	108	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	101	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	109	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	110	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	101	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	108	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	111	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	109	81	133	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3165722)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	84.6	66	112	
<b>EP004: Organic Matter (QCLot: 3156952)</b>									
EP004: Organic Matter	----	0.5	%	<0.5	4.58 %	103	85	105	
EP004: Total Organic Carbon	----	0.5	%	<0.5	2.66 %	103	84	106	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3156180)</b>									
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	99.4	57.4	117	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3160625)</b>									
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	89.8	64	126	
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	91.5	66	128	
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	88.3	63	129	
EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	91.9	63	129	
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	90.6	64	130	
EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	91.4	63	129	
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	90.2	63	129	
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	89.9	62	130	
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	88.5	61	131	
<b>EP074B: Oxygenated Compounds (QCLot: 3160625)</b>									
EP074: Vinyl Acetate	108-05-4	1	mg/kg	----	10 mg/kg	35.0	29.6	156	
		5	mg/kg	<5	----	----	----	----	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074B: Oxygenated Compounds (QCLot: 3160625) - continued</b>									
EP074: 2-Butanone (MEK)	78-93-3	1	mg/kg	----	10 mg/kg	104	58	136	
		5	mg/kg	<5	----	----	----	----	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	1	mg/kg	----	10 mg/kg	81.1	54	138	
		5	mg/kg	<5	----	----	----	----	
EP074: 2-Hexanone (MBK)	591-78-6	1	mg/kg	----	10 mg/kg	80.6	54	136	
		5	mg/kg	<5	----	----	----	----	
<b>EP074C: Sulfonated Compounds (QCLot: 3160625)</b>									
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	79.3	54	126	
<b>EP074D: Fumigants (QCLot: 3160625)</b>									
EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	80.6	55	133	
EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	92.7	69	127	
EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	91.7	54	124	
EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	82.5	51	125	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	91.5	66	126	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3160625)</b>									
EP074: Dichlorodifluoromethane	75-71-8	1	mg/kg	----	10 mg/kg	41.3	30	148	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloromethane	74-87-3	1	mg/kg	----	10 mg/kg	50.2	41	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Vinyl chloride	75-01-4	1	mg/kg	----	10 mg/kg	76.4	43	147	
		5	mg/kg	<5	----	----	----	----	
EP074: Bromomethane	74-83-9	1	mg/kg	----	10 mg/kg	64.0	47	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloroethane	75-00-3	1	mg/kg	----	10 mg/kg	75.0	49	143	
		5	mg/kg	<5	----	----	----	----	
EP074: Trichlorofluoromethane	75-69-4	1	mg/kg	----	10 mg/kg	76.6	49	135	
		5	mg/kg	<5	----	----	----	----	
EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	79.7	54	126	
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	78.2	43	129	
EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	85.2	62	130	
EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	90.6	66	132	
EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	90.0	66	132	
EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	89.0	62	126	
EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	89.5	64	128	
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	93.7	59	125	
EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	93.9	65	123	
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	91.5	64	120	
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	92.6	65	127	
EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	93.5	70	130	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3160625) - continued</b>									
EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	90.1	72	128	
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	94.6	67	143	
EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	96.2	62	122	
EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	75.7	54	128	
EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	73.7	55	129	
EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	88.6	56	132	
EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	93.8	65	135	
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	96.8	19.8	134	
EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	91.9	53	129	
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	101	48	136	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3160625)</b>									
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	94.6	70	128	
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	91.0	67	127	
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	92.4	64	130	
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	90.3	62	130	
EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	91.0	63	129	
EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	91.4	63	129	
EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	96.0	66	128	
EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	87.8	54	134	
EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	101	60	132	
<b>EP074G: Trihalomethanes (QCLot: 3160625)</b>									
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	93.7	62	120	
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	95.1	61	121	
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	97.8	63	121	
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	97.9	60	126	
<b>EP074H: Naphthalene (QCLot: 3160625)</b>									
EP074: Naphthalene	91-20-3	0.5	mg/kg	----	1 mg/kg	98.7	63	133	
		5	mg/kg	<5	----	----	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3158392)</b>									
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	91.4	74	116	
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	87.4	74	116	
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	101	72	116	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	98.5	69	123	
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	79.8	60.3	117	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	83.8	69	117	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	80.4	68	112	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	82.4	73	117	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	85.9	76.4	114	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3158392) - continued</b>									
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	73.2	57	111	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	70.2	68.9	112	
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	19.5	3.9	57	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3158392)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	84.6	80	124	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	89.5	77	123	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	87.9	79	123	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	92.4	77	123	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	92.1	79	123	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	92.5	79	123	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	94.0	79	123	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	95.5	79	125	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	88.2	73	121	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	91.8	81	123	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	87.8	70	118	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	91.0	77	123	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	83.1	76	122	
EP075(SIM): Indeno(1,2,3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	76.3	71	113	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	77.0	71.7	113	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	80.5	72.4	114	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3158391)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	90.4	71	131	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	95.4	74	138	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	101	64	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3160623)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	82.3	68.4	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3160624)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	102	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3158391)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	95.6	70	130	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	96.8	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	
		50	mg/kg	----	150 mg/kg	93.8	63	131	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3160623)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	79.7	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3160624)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	101	68.4	128	
<b>EP080: BTEXN (QCLot: 3160623)</b>									



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EP080: BTEXN (QCLot: 3160623) - continued</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	97.3	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	89.8	62	128	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	88.2	58	118	
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	85.3	60	120	
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	89.6	60	120	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	88.2	62	138	
<b>EP080: BTEXN (QCLot: 3160624)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	101	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	103	62	128	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	99.4	58	118	
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	101	60	120	
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	104	60	120	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	101	62	138	

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report				
				Spike Concentration	Spike Recovery(%)		Recovery Limits (%)	
					MS	Low	High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3165721)</b>								
ES1324472-002	MK-SB03-0.5	EG005T: Arsenic	7440-38-2	50 mg/kg	108	70	130	
		EG005T: Cadmium	7440-43-9	50 mg/kg	106	70	130	
		EG005T: Chromium	7440-47-3	50 mg/kg	108	70	130	
		EG005T: Copper	7440-50-8	125 mg/kg	105	70	130	
		EG005T: Lead	7439-92-1	125 mg/kg	106	70	130	
		EG005T: Nickel	7440-02-0	50 mg/kg	115	70	130	
		EG005T: Selenium	7782-49-2	50 mg/kg	105	70	130	
		EG005T: Zinc	7440-66-6	125 mg/kg	121	70	130	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3165722)</b>								
ES1324472-002	MK-SB03-0.5	EG035T: Mercury	7439-97-6	5 mg/kg	98.4	70	130	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3156180)</b>								
ES1324476-007	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	110	70	130	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3160625)</b>								
ES1324471-002	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	98.2	70	130	



Sub-Matrix: SOIL				Matrix Spike (MS) Report				
				Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3160625) - continued</b>								
ES1324471-002	Anonymous	EP074: Trichloroethene	79-01-6	2.5 mg/kg	97.3	70	130	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3160625)</b>								
ES1324471-002	Anonymous	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	98.6	70	130	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3158392)</b>								
ES1324472-002	MK-SB03-0.5	EP075(SIM): Phenol	108-95-2	10 mg/kg	77.6	70	130	
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	79.4	70	130	
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	67.9	60	130	
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	77.9	70	130	
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	48.5	20	130	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3158392)</b>								
ES1324472-002	MK-SB03-0.5	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	76.4	70	130	
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	82.8	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3158391)</b>								
ES1324472-002	MK-SB03-0.5	EP071: C10 - C14 Fraction	----	640 mg/kg	75.7	73	137	
		EP071: C15 - C28 Fraction	----	3140 mg/kg	77.1	53	131	
		EP071: C29 - C36 Fraction	----	2860 mg/kg	69.8	52	132	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3160623)</b>								
EN1304177-018	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	89.6	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3160624)</b>								
ES1324471-002	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	107	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3158391)</b>								
ES1324472-002	MK-SB03-0.5	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	94.2	73	137	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	72.3	53	131	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	56.2	52	132	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3160623)</b>								
EN1304177-018	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	85.3	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3160624)</b>								
ES1324471-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	104	70	130	
<b>EP080: BTEXN (QCLot: 3160623)</b>								
EN1304177-018	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	90.5	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	88.4	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	84.4	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	85.9	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	88.2	70	130	
		EP080: Naphthalene	91-20-3	2.5 mg/kg	92.3	70	130	



Sub-Matrix: SOIL

				Matrix Spike (MS) Report				
				Spike Concentration	Spike Recovery(%) MS	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EP080: BTEXN (QCLot: 3160624)</b>								
ES1324471-002	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	96.9	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	98.4	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	98.5	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	97.5	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	101	70	130	
	EP080: Naphthalene	91-20-3	2.5 mg/kg	98.3	70	130		

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3156180)</b>										
ES1324476-007	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	110	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3158391)</b>										
ES1324472-002	MK-SB03-0.5	EP071: C10 - C14 Fraction	----	640 mg/kg	75.7	----	73	137	----	----
		EP071: C15 - C28 Fraction	----	3140 mg/kg	77.1	----	53	131	----	----
		EP071: C29 - C36 Fraction	----	2860 mg/kg	69.8	----	52	132	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3158391)</b>										
ES1324472-002	MK-SB03-0.5	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	94.2	----	73	137	----	----
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	72.3	----	53	131	----	----
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	56.2	----	52	132	----	----
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3158392)</b>										
ES1324472-002	MK-SB03-0.5	EP075(SIM): Phenol	108-95-2	10 mg/kg	77.6	----	70	130	----	----
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	79.4	----	70	130	----	----
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	67.9	----	60	130	----	----
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	77.9	----	70	130	----	----
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	48.5	----	20	130	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3158392)</b>										
ES1324472-002	MK-SB03-0.5	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	76.4	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	82.8	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3160623)</b>										
EN1304177-018	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	89.6	----	70	130	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3160623)</b>										
EN1304177-018	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	85.3	----	70	130	----	----





Sub-Matrix: SOIL

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>EP080: BTEXN (QCLot: 3160623)</b>										
EN1304177-018	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	90.5	----	70	130	----	----
		EP080: Toluene	108-88-3	2.5 mg/kg	88.4	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	84.4	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	85.9	----	70	130	----	----
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	88.2	----	70	130	----	----
		EP080: Naphthalene	91-20-3	2.5 mg/kg	92.3	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3160624)</b>										
ES1324471-002	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	107	----	70	130	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3160624)</b>										
ES1324471-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	104	----	70	130	----	----
<b>EP080: BTEXN (QCLot: 3160624)</b>										
ES1324471-002	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	96.9	----	70	130	----	----
		EP080: Toluene	108-88-3	2.5 mg/kg	98.4	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	98.5	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	97.5	----	70	130	----	----
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	101	----	70	130	----	----
		EP080: Naphthalene	91-20-3	2.5 mg/kg	98.3	----	70	130	----	----
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3160625)</b>										
ES1324471-002	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	98.2	----	70	130	----	----
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	97.3	----	70	130	----	----
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3160625)</b>										
ES1324471-002	Anonymous	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	98.6	----	70	130	----	----
<b>EG005T: Total Metals by ICP-AES (QCLot: 3165721)</b>										
ES1324472-002	MK-SB03-0.5	EG005T: Arsenic	7440-38-2	50 mg/kg	108	----	70	130	----	----
		EG005T: Cadmium	7440-43-9	50 mg/kg	106	----	70	130	----	----
		EG005T: Chromium	7440-47-3	50 mg/kg	108	----	70	130	----	----
		EG005T: Copper	7440-50-8	125 mg/kg	105	----	70	130	----	----
		EG005T: Lead	7439-92-1	125 mg/kg	106	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	115	----	70	130	----	----
		EG005T: Selenium	7782-49-2	50 mg/kg	105	----	70	130	----	----
		EG005T: Zinc	7440-66-6	125 mg/kg	121	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3165722)</b>										
ES1324472-002	MK-SB03-0.5	EG035T: Mercury	7439-97-6	5 mg/kg	98.4	----	70	130	----	----



## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1324472</b>	Page	: 1 of 10
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: PROJECT SYMPHONY-MP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 12-NOV-2013
C-O-C number	: ----	Issue Date	: 22-NOV-2013
Sampler	: TS/GP	No. of samples received	: 12
Order number	: 0207423	No. of samples analysed	: 7
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EA002 : pH (Soils)</b>							
<b>Soil Glass Jar - Unpreserved (EA002)</b> ML-MW07-0.2	08-NOV-2013	15-NOV-2013	15-NOV-2013	✓	15-NOV-2013	16-NOV-2013	✓
<b>EA055: Moisture Content</b>							
<b>Soil Glass Jar - Unpreserved (EA055-103)</b> MK-SB03-0.5, MK-SB01-0.2, MK-SB08-0.2, ML-MW07-0.2	08-NOV-2013	----	----	----	15-NOV-2013	22-NOV-2013	✓
<b>EA150: Particle Sizing</b>							
<b>Snap Lock Bag (EA150H)</b> ML-MW07-0.2	08-NOV-2013	---	07-MAY-2014	----	18-NOV-2013	07-MAY-2014	✓
<b>EA150: Soil Classification based on Particle Size</b>							
<b>Snap Lock Bag (EA150H)</b> ML-MW07-0.2	08-NOV-2013	---	07-MAY-2014	----	18-NOV-2013	07-MAY-2014	✓
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>							
<b>Snap Lock Bag (EA200)</b> MK-SB03-0.5, MK-SB01-0.2, MK-SB08-0.2, ML-MW07-0.2	08-NOV-2013	---	07-MAY-2014	----	20-NOV-2013	19-MAY-2014	✓
<b>ED008: Exchangeable Cations</b>							
<b>Soil Glass Jar - Unpreserved (ED008)</b> ML-MW07-0.2	08-NOV-2013	15-NOV-2013	06-DEC-2013	✓	19-NOV-2013	06-DEC-2013	✓
<b>EG005T: Total Metals by ICP-AES</b>							
<b>Soil Glass Jar - Unpreserved (EG005T)</b> MK-SB03-0.5, MK-SB01-0.2, MK-SB08-0.2, ML-MW07-0.2	08-NOV-2013	19-NOV-2013	07-MAY-2014	✓	19-NOV-2013	07-MAY-2014	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>							
<b>Soil Glass Jar - Unpreserved (EG035T)</b> MK-SB03-0.5, MK-SB01-0.2, MK-SB08-0.2, ML-MW07-0.2	08-NOV-2013	19-NOV-2013	06-DEC-2013	✓	20-NOV-2013	06-DEC-2013	✓
<b>EP004: Organic Matter</b>							
<b>Soil Glass Jar - Unpreserved (EP004)</b> ML-MW07-0.2	08-NOV-2013	14-NOV-2013	06-DEC-2013	✓	14-NOV-2013	06-DEC-2013	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP066: Polychlorinated Biphenyls (PCB)</b>							
Soil Glass Jar - Unpreserved (EP066) ML-MW07-0.2	08-NOV-2013	14-NOV-2013	22-NOV-2013	✓	15-NOV-2013	24-DEC-2013	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>							
Soil Glass Jar - Unpreserved (EP071) MK-SB03-0.5, MK-SB01-0.2, MK-SB08-0.2, ML-MW07-0.2	08-NOV-2013	14-NOV-2013	22-NOV-2013	✓	15-NOV-2013	24-DEC-2013	✓
<b>EP074D: Fumigants</b>							
Soil Glass Jar - Unpreserved (EP074) ML-MW07-0.2	08-NOV-2013	15-NOV-2013	15-NOV-2013	✓	15-NOV-2013	15-NOV-2013	✓
<b>EP074E: Halogenated Aliphatic Compounds</b>							
Soil Glass Jar - Unpreserved (EP074) ML-MW07-0.2	08-NOV-2013	15-NOV-2013	15-NOV-2013	✓	15-NOV-2013	15-NOV-2013	✓
<b>EP074F: Halogenated Aromatic Compounds</b>							
Soil Glass Jar - Unpreserved (EP074) ML-MW07-0.2	08-NOV-2013	15-NOV-2013	15-NOV-2013	✓	15-NOV-2013	15-NOV-2013	✓
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>							
Soil Glass Jar - Unpreserved (EP074) ML-MW07-0.2	08-NOV-2013	15-NOV-2013	15-NOV-2013	✓	15-NOV-2013	15-NOV-2013	✓
<b>EP074H: Naphthalene</b>							
Soil Glass Jar - Unpreserved (EP074) ML-MW07-0.2	08-NOV-2013	15-NOV-2013	15-NOV-2013	✓	15-NOV-2013	15-NOV-2013	✓
<b>EP074B: Oxygenated Compounds</b>							
Soil Glass Jar - Unpreserved (EP074) ML-MW07-0.2	08-NOV-2013	15-NOV-2013	15-NOV-2013	✓	15-NOV-2013	15-NOV-2013	✓
<b>EP074C: Sulfonated Compounds</b>							
Soil Glass Jar - Unpreserved (EP074) ML-MW07-0.2	08-NOV-2013	15-NOV-2013	15-NOV-2013	✓	15-NOV-2013	15-NOV-2013	✓
<b>EP074G: Trihalomethanes</b>							
Soil Glass Jar - Unpreserved (EP074) ML-MW07-0.2	08-NOV-2013	15-NOV-2013	15-NOV-2013	✓	15-NOV-2013	15-NOV-2013	✓
<b>EP075(SIM)A: Phenolic Compounds</b>							
Soil Glass Jar - Unpreserved (EP075(SIM)) MK-SB03-0.5, MK-SB01-0.2, MK-SB08-0.2, ML-MW07-0.2	08-NOV-2013	14-NOV-2013	22-NOV-2013	✓	15-NOV-2013	24-DEC-2013	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>							
Soil Glass Jar - Unpreserved (EP075(SIM)) MK-SB03-0.5, MK-SB01-0.2, MK-SB08-0.2, ML-MW07-0.2	08-NOV-2013	14-NOV-2013	22-NOV-2013	✓	15-NOV-2013	24-DEC-2013	✓



Matrix: SOIL

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP080: BTEXN</b>							
Soil Glass Jar - Unpreserved (EP080) TRIP BLANK	04-NOV-2013	19-NOV-2013	18-NOV-2013	✖	19-NOV-2013	18-NOV-2013	✖
Soil Glass Jar - Unpreserved (EP080) ML-MW07-0.2	08-NOV-2013	15-NOV-2013	22-NOV-2013	✔	15-NOV-2013	22-NOV-2013	✔
Soil Glass Jar - Unpreserved (EP080) MK-SB03-0.5, MK-SB01-0.2	MK-SB08-0.2, 08-NOV-2013	19-NOV-2013	22-NOV-2013	✔	19-NOV-2013	22-NOV-2013	✔
Soil Glass Jar - Unpreserved (EP080) TSC	30-OCT-2013	15-NOV-2013	13-NOV-2013	✖	15-NOV-2013	13-NOV-2013	✖
Soil Glass Jar - Unpreserved (EP080) TRIP SPIKE (14)	30-OCT-2013	19-NOV-2013	13-NOV-2013	✖	19-NOV-2013	13-NOV-2013	✖
<b>EP080/071: Total Petroleum Hydrocarbons</b>							
Soil Glass Jar - Unpreserved (EP080) TRIP BLANK	04-NOV-2013	19-NOV-2013	18-NOV-2013	✖	19-NOV-2013	18-NOV-2013	✖
Soil Glass Jar - Unpreserved (EP080) ML-MW07-0.2	08-NOV-2013	15-NOV-2013	22-NOV-2013	✔	15-NOV-2013	22-NOV-2013	✔
Soil Glass Jar - Unpreserved (EP080) MK-SB03-0.5, MK-SB01-0.2	MK-SB08-0.2, 08-NOV-2013	19-NOV-2013	22-NOV-2013	✔	19-NOV-2013	22-NOV-2013	✔
Soil Glass Jar - Unpreserved (EP080) TSC	30-OCT-2013	15-NOV-2013	13-NOV-2013	✖	15-NOV-2013	13-NOV-2013	✖
Soil Glass Jar - Unpreserved (EP080) TRIP SPIKE (14)	30-OCT-2013	19-NOV-2013	13-NOV-2013	✖	19-NOV-2013	13-NOV-2013	✖



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Laboratory Duplicates (DUP)</b>							
Exchangeable Cations with pre-treatment	ED008	1	4	25.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Moisture Content	EA055-103	2	17	11.8	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organic Matter	EP004	1	7	14.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
pH (1:5)	EA002	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	12	16.7	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	12	16.7	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	3	26	11.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	5	20.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
Exchangeable Cations with pre-treatment	ED008	1	4	25.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organic Matter	EP004	1	7	14.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	26	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	5	20.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
Exchangeable Cations with pre-treatment	ED008	1	4	25.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organic Matter	EP004	1	7	14.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	26	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	5	20.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
Organic Matter	EP004	1	7	14.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



Matrix: **SOIL** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
<i>Analytical Methods</i>							
<b>Matrix Spikes (MS) - Continued</b>							
Total Metals by ICP-AES	EG005T	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	26	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	5	20.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH (1:5)	EA002	SOIL	(APHA 21st ed., 4500H+) pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM (2013) Schedule B(3) (Method 103)
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Particle Size Analysis by Hydrometer	EA150H	SOIL	Particle Size Analysis by Hydrometer according to AS1289.3.6.3 - 2003
Asbestos Identification in bulk solids	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples
Exchangeable Cations with pre-treatment	ED008	SOIL	Rayment & Higginson (1992) Method 15A2. Soluble salts are removed from the sample prior to analysis. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. This method is compliant with NEPM (2013) Schedule B(3) (Method 301)
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Organic Matter	EP004	SOIL	AS1289.4.1.1 - 1997., Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM (2013) Schedule B(3) (Method 105)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (2013) Schedule B(3) (Method 506.1)
Volatile Organic Compounds	EP074	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
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Preparation Methods	Method	Matrix	Method Descriptions
Exchangeable Cations Preparation Method	ED007PR	SOIL	Rayment & Higginson (1992) method 15A1. A 1M NH <sub>4</sub> Cl extraction by end over end tumbling at a ratio of 1:20. There is no pretreatment for soluble salts. Extracts can be run by ICP for cations.
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of distilled water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Organic Matter	EP004-PR	SOIL	AS1289.4.1.1 - 1997., Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM (2013) Schedule B(3) (Method 105)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option A - Concentrating)	ORG17A	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.





## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.
- For all matrices, no Matrix Spike outliers occur.

#### Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

Matrix: SOIL

Method	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
<b>EP080/071: Total Petroleum Hydrocarbons</b>						
Soil Glass Jar - Unpreserved TRIP BLANK	19-NOV-2013	18-NOV-2013	1	19-NOV-2013	18-NOV-2013	1
Soil Glass Jar - Unpreserved TSC	15-NOV-2013	13-NOV-2013	2	15-NOV-2013	13-NOV-2013	2
Soil Glass Jar - Unpreserved TRIP SPIKE (14)	19-NOV-2013	13-NOV-2013	6	19-NOV-2013	13-NOV-2013	6
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>						
Soil Glass Jar - Unpreserved TRIP BLANK	19-NOV-2013	18-NOV-2013	1	19-NOV-2013	18-NOV-2013	1
Soil Glass Jar - Unpreserved TSC	15-NOV-2013	13-NOV-2013	2	15-NOV-2013	13-NOV-2013	2
Soil Glass Jar - Unpreserved TRIP SPIKE (14)	19-NOV-2013	13-NOV-2013	6	19-NOV-2013	13-NOV-2013	6
<b>EP080: BTEXN</b>						
Soil Glass Jar - Unpreserved TRIP BLANK	19-NOV-2013	18-NOV-2013	1	19-NOV-2013	18-NOV-2013	1
Soil Glass Jar - Unpreserved TSC	15-NOV-2013	13-NOV-2013	2	15-NOV-2013	13-NOV-2013	2
Soil Glass Jar - Unpreserved TRIP SPIKE (14)	19-NOV-2013	13-NOV-2013	6	19-NOV-2013	13-NOV-2013	6



### ***Outliers : Frequency of Quality Control Samples***

The following report highlights breaches in the Frequency of Quality Control Samples.

- **No Quality Control Sample Frequency Outliers exist.**
-

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

**Work Order : ES1324472**

<p><b>Client : ENVIRO RESOURCES MANAGEMENT</b></p> <p><b>Contact : MR JONATHAN LEKAWSKI</b></p> <p><b>Address : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007</b></p>	<p><b>Laboratory : Environmental Division Sydney</b></p> <p><b>Contact : Barbara Hanna</b></p> <p><b>Address : 277-289 Woodpark Road Smithfield NSW Australia 2164</b></p>
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<p><b>E-mail : jonathan.lekawski@erm.com</b></p> <p><b>Telephone : +61 02 8584 8888</b></p> <p><b>Facsimile : +61 02 8584 8800</b></p>	<p><b>E-mail : Barbara.Hanna@alsglobal.com</b></p> <p><b>Telephone : +61 2 8784 8555</b></p> <p><b>Facsimile : +61 2 8784 8555</b></p>
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<p><b>Project : PROJECT SYMPHONY-MP</b></p> <p><b>Order number : 0207423</b></p> <p><b>C-O-C number : ----</b></p> <p><b>Site : ----</b></p> <p><b>Sampler : TS/GP</b></p>	<p><b>Page : 1 of 3</b></p> <p><b>Quote number : ES2013ENVRES0370 (SY/278/13 V3)</b></p> <p><b>QC Level : NEPM 2013 Schedule B(3) and ALS QCS3 requirement</b></p>
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#### Dates

<p><b>Date Samples Received : 12-NOV-2013</b></p> <p><b>Client Requested Due Date : 21-NOV-2013</b></p>	<p><b>Issue Date : 13-NOV-2013 10:24</b></p> <p><b>Scheduled Reporting Date : 21-NOV-2013</b></p>
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#### Delivery Details

<p><b>Mode of Delivery : Carrier</b></p> <p><b>No. of coolers/boxes : 1 HARD</b></p> <p><b>Security Seal : Intact.</b></p>	<p><b>Temperature : 8.3°C - Ice present</b></p> <p><b>No. of samples received : 12</b></p> <p><b>No. of samples analysed : 7</b></p>
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#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Asbestos and PSD analysis will be conducted by ALS Newcastle.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA002 pH (1:5)	SOIL - EA150H Particle Size Analysis by Hydrometer AS1289	SOIL - EA200 Asbestos Identification in Soils	SOIL - ED008 Exchangeable Cations with pre-treatment -All	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP004 (Carbon) Total Organic Carbon (Calc.)	SOIL - EP066 (solids) Polychlorinated Biphenyls by GCMS
ES1324472-001	08-NOV-2013 08:30	MK-SB03-0.1	✓							
ES1324472-002	08-NOV-2013 08:40	MK-SB03-0.5				✓		✓		
ES1324472-003	08-NOV-2013 08:55	MK-SB03-1.0	✓							
ES1324472-006	08-NOV-2013 09:50	MK-SB08-0.2				✓		✓		
ES1324472-007	08-NOV-2013 09:55	MK-SB08-0.5	✓							
ES1324472-008	08-NOV-2013 10:13	MK-SB08-0.8	✓							
ES1324472-009	08-NOV-2013 11:10	MK-SB01-0.2				✓		✓		
ES1324472-010	08-NOV-2013 12:40	ML-MW07-0.2		✓	✓	✓	✓	✓	✓	✓
ES1324472-011	08-NOV-2013 12:45	ML-MW07-0.5	✓							

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EP074 (solids) Volatile Organic Compounds	SOIL - S-18 (NO MOIST) TRH(C6-C9)/BTEXN with No Moisture for TBs	SOIL - S-27 TRH/BTEXN/PAH/Phenols/8Metals
ES1324472-002	08-NOV-2013 08:40	MK-SB03-0.5			✓
ES1324472-004	04-NOV-2013 15:00	TRIP BLANK		✓	
ES1324472-005	30-OCT-2013 15:00	TRIP SPIKE (14)		✓	
ES1324472-006	08-NOV-2013 09:50	MK-SB08-0.2			✓
ES1324472-009	08-NOV-2013 11:10	MK-SB01-0.2			✓
ES1324472-010	08-NOV-2013 12:40	ML-MW07-0.2	✓		✓
ES1324472-012	30-OCT-2013 15:00	TSC		✓	

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Attachment - Report ( SUBCO )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Attachment - Report ( SUBCO )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
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Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )
- Attachment - Report ( SUBCO )

Email au.accounts@erm.com  
Email au.accounts@erm.com

UNDELADE 21 Emma Road Picnic SA 5095  
 Ph: 08 8394 0980 E: aelaide@alsglobal.com  
 LBRISBANE 32 Stuart Street St Leonards QLD 4053  
 Ph: 07 3243 7222 E: samples.lbr@alsglobal.com  
 DELAUNDRINE 48 Callanmore Drive Clayton QLD 4880  
 Ph: 07 7471 5500 E: gdeland@alsglobal.com

DMACKAY 78 Harrow Road Mackay QLD 4740  
 Ph: 07 4544 0177 E: mackay@alsglobal.com  
 DANIEL BOLLING 241 Wessell Road Springvale VIC 3171  
 Ph: 03 8549 9600 E: samples.dan@alsglobal.com  
 DANJURGIE 27 Sydney Road Malaga NSW 2280  
 Ph: 02 5972 0785 E: murgie@alsglobal.com

DNEWCASTLE 3 Rogan Gunn Road Warminster NSW 2304  
 Ph: 02 4958 9433 E: samples.newcastle@alsglobal.com  
 DNOONJA 413 Geary Place North Nona NSW 2564  
 Ph: 02 4423 2008 E: noonja@alsglobal.com  
 DPERTH 10 Red Way Malaga WA 6000  
 Ph: 08 9208 7855 E: samples.perth@alsglobal.com

STONEY 277 289 Woodpark Road Smithfield NSW 2164  
 Ph: 02 8724 8555 E: samples.stoney@alsglobal.com  
 DTCOWNSVILLE 14-15 Dorrain Court Dore QLD 4818  
 Ph: 07 4601 4500 E: samples.cow@alsglobal.com

CLIENT: ERM

OFFICE: Sydney

PROJECT: Project Symphony - MP

ORDER NUMBER: 0207423

PROJECT MANAGER: Jonathan Lekawski

SAMPLER: Travone Shaw/Gavin Powell

SAMPLER MOBILE: 0425 960 085

CONTACT PH: SYZ78/13

COC emailed to ALS? (YES/NO)

EDD FORMAT (or default): pdiffsvsdat

Email Reports to (will default to PM if no other addresses are listed): Symphony.DeltaWest@erm.com

Email Invoice to (will default to PM if no other addresses are listed): Symphony.DeltaWest@erm.com

TURNAROUND REQUIREMENTS:

Standard TAT may be longer for some tests e.g. Ultra Trace Organics

ALS QUOTE NO: SYZ78/13

RELINQUISHED BY: Travone Shaw

DATE/TIME: 11-11-13 15:00

RECEIVED BY:

DATE/TIME:

RELINQUISHED

DATE/TIME:

FOR LABO

Check Seal

Free CO2/ Nitrogen

Retention Seal

Other Comment

Barcode

Telephone: +61-2-8784 8555

Environmental Division

Sydney

Work Order

ES1324472

Additional Information

Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.

ANALYSIS REQUIRED including SUITES (NB: Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).

Additional Information

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (codes below)	REFER TO	TOTAL CONTAINERS	S-27 (8 metals- As, Cd, Cr, Cu, Ni, Pb, Zn, Hg, TRH/BTEX, PAH/Phenols)	Additional Metal - Se	TRH / BTEX / PAH / Phenol	Asbestos	VOC Scan	PCB	Particle Sizing (hydrometer), TOC -	pH, Exchangeable Cations plus ECEC	Additional Information
1	MK-SB03-0.1	8-11-13 8:30	SOIL	1 jar, 1 bag	ICE	2	X	X	X	X					HOLD
2	MK-SB03-0.5	8:40	"	"	"	2	X	X	X	X					HOLD
3	MK-SB03-1.0	8:55	"	1 jar	"	1									HOLD
4	Tip Blank	4-11-13	"	1 jar	"	1									HOLD
5	Tip Spill (14)	30-10-13	"	1 jar	"	1									HOLD
6	MK-SB08-0.2	8-11-13/09:50	"	1 jar, 1 bag	"	2	X	X	X	X					HOLD
7	MK-SB08-0.5	09:55	"	"	"	2									HOLD
8	MK-SB08-0.8	10:13	"	1 jar	"	1									HOLD
9	MK-SB01-0.2	11:10	"	1 jar 1 bag	"	2	X	X	X	X					HOLD
10	ML-MW07-0.2	12:40	"	1 jar 2 bags	"	3	X	X	X	X					HOLD
11	ML-MW07-0.5	12:45	"	1 jar 1 bag	"	2									HOLD
12	75c														HOLD
TOTAL															

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airtight Unpreserved Plastic  
 V = VOA Vial HQ Preserved; VA = VOA Vial Sodium Bisulfate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airtight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;  
 Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulfate Solids; B = Unpreserved Bag.



## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>ES1324473</b> <b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : MR JONATHAN LEKAWSKI <b>Address</b> : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007  <b>E-mail</b> : jonathan.lekawski@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800 <b>Project</b> : PROJECT SYMPHONY-MP <b>Order number</b> : 0207423 <b>C-O-C number</b> : ---- <b>Sampler</b> : TS/GP <b>Site</b> : ----  <b>Quote number</b> : SY/278/13 V3	<b>Page</b> : 1 of 11  <b>Laboratory</b> : Environmental Division Sydney <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164  <b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555 <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement  <b>Date Samples Received</b> : 12-NOV-2013 <b>Issue Date</b> : 19-NOV-2013  <b>No. of samples received</b> : 18 <b>No. of samples analysed</b> : 10
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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Peter Rennie	Asbestos Identifier	Newcastle - Asbestos
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Organics





## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EA200 Legend**
- **EA200 'Am' Amosite (brown asbestos)**
- **EA200 'Ch' Chrysotile (white asbestos)**
- **EA200 'Cr' Crocidolite (blue asbestos)**
- **EA200 'Trace' - Asbestos fibres detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres**
- **EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.**
- **EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.**
- **EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.**
- **EP080: The TRIP SPIKE and TRIP SPIKE CONTROL have been analysed for volatile TPH and BTEX only. The TRIP SPIKE and TRIP SPIKE CONTROL were prepared in the lab using reagent grade sand spiked with petrol. The TRIP SPIKE was dispatched from the lab and the TRIP SPIKE CONTROL retained. The spike samples were extracted and analysed concurrently with samples reported in this batch.**



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				TRIP SPIKE 2	TRIP BLANK	MK_SB49_0.5	D01_071113_TS	MK_SB65_0.5
				31-OCT-2013 15:00	04-NOV-2013 15:00	07-NOV-2013 08:50	07-NOV-2013 15:00	07-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324473-001	ES1324473-002	ES1324473-004	ES1324473-005	ES1324473-008
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	----	----	24.1	27.7	----
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	----	----	No	----	No
Asbestos Type	1332-21-4	0.1	--	----	----	-	----	-
Sample weight (dry)	----	0.01	g	----	----	241	----	170
APPROVED IDENTIFIER:	----	-	--	----	----	P.RENNIE	----	P.RENNIE
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	----	----	<5	<5	----
Arsenic	7440-38-2	5	mg/kg	----	----	10	7	----
Cadmium	7440-43-9	1	mg/kg	----	----	<1	<1	----
Chromium	7440-47-3	2	mg/kg	----	----	10	8	----
Copper	7440-50-8	5	mg/kg	----	----	26	24	----
Lead	7439-92-1	5	mg/kg	----	----	49	20	----
Nickel	7440-02-0	2	mg/kg	----	----	34	36	----
Zinc	7440-66-6	5	mg/kg	----	----	145	130	----
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	----	----	<0.1	<0.1	----
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	0.1	mg/kg	----	----	<0.1	<0.1	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	----	----	<0.5	<0.5	----
Isopropylbenzene	98-82-8	0.5	mg/kg	----	----	<0.5	<0.5	----
n-Propylbenzene	103-65-1	0.5	mg/kg	----	----	<0.5	<0.5	----
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	----	----	<0.5	<0.5	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	----	----	<0.5	<0.5	----
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	----	----	<0.5	<0.5	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	----	----	<0.5	<0.5	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	----	----	<0.5	<0.5	----
n-Butylbenzene	104-51-8	0.5	mg/kg	----	----	<0.5	<0.5	----
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	----	----	<5	<5	----
2-Butanone (MEK)	78-93-3	5	mg/kg	----	----	<5	<5	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	----	----	<5	<5	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				TRIP SPIKE 2	TRIP BLANK	MK_SB49_0.5	D01_071113_TS	MK_SB65_0.5
				31-OCT-2013 15:00	04-NOV-2013 15:00	07-NOV-2013 08:50	07-NOV-2013 15:00	07-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324473-001	ES1324473-002	ES1324473-004	ES1324473-005	ES1324473-008
<b>EP074B: Oxygenated Compounds - Continued</b>								
2-Hexanone (MBK)	591-78-6	5	mg/kg	----	----	<5	<5	----
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	----	----	<0.5	<0.5	----
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	----	----	<0.5	<0.5	----
1,2-Dichloropropane	78-87-5	0.5	mg/kg	----	----	<0.5	<0.5	----
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	----	----	<0.5	<0.5	----
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	----	----	<0.5	<0.5	----
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	----	----	<0.5	<0.5	----
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	----	----	<5	<5	----
Chloromethane	74-87-3	5	mg/kg	----	----	<5	<5	----
Vinyl chloride	75-01-4	5	mg/kg	----	----	<5	<5	----
Bromomethane	74-83-9	5	mg/kg	----	----	<5	<5	----
Chloroethane	75-00-3	5	mg/kg	----	----	<5	<5	----
Trichlorofluoromethane	75-69-4	5	mg/kg	----	----	<5	<5	----
1,1-Dichloroethene	75-35-4	0.5	mg/kg	----	----	<0.5	<0.5	----
Iodomethane	74-88-4	0.5	mg/kg	----	----	<0.5	<0.5	----
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	----	----	<0.5	<0.5	----
1,1-Dichloroethane	75-34-3	0.5	mg/kg	----	----	<0.5	<0.5	----
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	----	----	<0.5	<0.5	----
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	----	----	<0.5	<0.5	----
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	----	----	<0.5	<0.5	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg	----	----	<0.5	<0.5	----
1,2-Dichloroethane	107-06-2	0.5	mg/kg	----	----	<0.5	<0.5	----
Trichloroethene	79-01-6	0.5	mg/kg	----	----	<0.5	<0.5	----
Dibromomethane	74-95-3	0.5	mg/kg	----	----	<0.5	<0.5	----
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	----	----	<0.5	<0.5	----
1,3-Dichloropropane	142-28-9	0.5	mg/kg	----	----	<0.5	<0.5	----
Tetrachloroethene	127-18-4	0.5	mg/kg	----	----	<0.5	<0.5	----
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	----	----	<0.5	<0.5	----
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	----	----	<0.5	<0.5	----
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	----	----	<0.5	<0.5	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				TRIP SPIKE 2	TRIP BLANK	MK_SB49_0.5	D01_071113_TS	MK_SB65_0.5
				31-OCT-2013 15:00	04-NOV-2013 15:00	07-NOV-2013 08:50	07-NOV-2013 15:00	07-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324473-001	ES1324473-002	ES1324473-004	ES1324473-005	ES1324473-008
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	----	----	<0.5	<0.5	----
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	----	----	<0.5	<0.5	----
Pentachloroethane	76-01-7	0.5	mg/kg	----	----	<0.5	<0.5	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	----	----	<0.5	<0.5	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg	----	----	<0.5	<0.5	----
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	----	----	<0.5	<0.5	----
Bromobenzene	108-86-1	0.5	mg/kg	----	----	<0.5	<0.5	----
2-Chlorotoluene	95-49-8	0.5	mg/kg	----	----	<0.5	<0.5	----
4-Chlorotoluene	106-43-4	0.5	mg/kg	----	----	<0.5	<0.5	----
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	----	----	<0.5	<0.5	----
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	----	----	<0.5	<0.5	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	----	----	<0.5	<0.5	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	----	----	<0.5	<0.5	----
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	----	----	<0.5	<0.5	----
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	----	----	<0.5	<0.5	----
Bromodichloromethane	75-27-4	0.5	mg/kg	----	----	<0.5	<0.5	----
Dibromochloromethane	124-48-1	0.5	mg/kg	----	----	<0.5	<0.5	----
Bromoform	75-25-2	0.5	mg/kg	----	----	<0.5	<0.5	----
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	5	mg/kg	----	----	<5	<5	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	----	----	<0.5	<0.5	----
2-Chlorophenol	95-57-8	0.5	mg/kg	----	----	<0.5	<0.5	----
2-Methylphenol	95-48-7	0.5	mg/kg	----	----	<0.5	<0.5	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	----	----	<1	<1	----
2-Nitrophenol	88-75-5	0.5	mg/kg	----	----	<0.5	<0.5	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	----	----	<0.5	<0.5	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	----	----	<0.5	<0.5	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	----	----	<0.5	<0.5	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	----	----	<0.5	<0.5	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	----	----	<0.5	<0.5	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				TRIP SPIKE 2	TRIP BLANK	MK_SB49_0.5	D01_071113_TS	MK_SB65_0.5
				31-OCT-2013 15:00	04-NOV-2013 15:00	07-NOV-2013 08:50	07-NOV-2013 15:00	07-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324473-001	ES1324473-002	ES1324473-004	ES1324473-005	ES1324473-008
<b>EP075(SIM)A: Phenolic Compounds - Continued</b>								
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	----	----	<0.5	<0.5	----
Pentachlorophenol	87-86-5	2	mg/kg	----	----	<2	<2	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	----	----	<0.5	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg	----	----	<0.5	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg	----	----	<0.5	<0.5	----
Fluorene	86-73-7	0.5	mg/kg	----	----	<0.5	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg	----	----	<0.5	<0.5	----
Anthracene	120-12-7	0.5	mg/kg	----	----	<0.5	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg	----	----	<0.5	<0.5	----
Pyrene	129-00-0	0.5	mg/kg	----	----	<0.5	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	----	<0.5	<0.5	----
Chrysene	218-01-9	0.5	mg/kg	----	----	<0.5	<0.5	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	----	----	<0.5	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	----	<0.5	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	----	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	----	<0.5	<0.5	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	----	----	<0.5	<0.5	----
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	----	----	<0.5	<0.5	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	----	----	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	----	----	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	----	----	<b>0.6</b>	<b>0.6</b>	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	----	----	<b>1.2</b>	<b>1.2</b>	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<b>53</b>	<10	<10	<10	----
C10 - C14 Fraction	----	50	mg/kg	----	----	<50	<50	----
C15 - C28 Fraction	----	100	mg/kg	----	----	<100	<100	----
C29 - C36 Fraction	----	100	mg/kg	----	----	<100	<100	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	----	----	<50	<50	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<b>62</b>	<10	<10	<10	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<b>32</b>	<10	<10	<10	----
>C10 - C16 Fraction	>C10_C16	50	mg/kg	----	----	<50	<50	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				TRIP SPIKE 2	TRIP BLANK	MK_SB49_0.5	D01_071113_TS	MK_SB65_0.5
				31-OCT-2013 15:00	04-NOV-2013 15:00	07-NOV-2013 08:50	07-NOV-2013 15:00	07-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324473-001	ES1324473-002	ES1324473-004	ES1324473-005	ES1324473-008
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 - Continued</b>								
>C16 - C34 Fraction	----	100	mg/kg	----	----	<100	<100	----
>C34 - C40 Fraction	----	100	mg/kg	----	----	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	----	----	<50	<50	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	----	----	<50	<50	----
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	0.5	<0.2	<0.2	<0.2	----
Toluene	108-88-3	0.5	mg/kg	13.8	<0.5	<0.5	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg	2.1	<0.5	<0.5	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	9.9	<0.5	<0.5	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg	4.2	<0.5	<0.5	<0.5	----
^ Sum of BTEX	----	0.2	mg/kg	30.5	<0.2	<0.2	<0.2	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	14.1	<0.5	<0.5	<0.5	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	----
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	----	----	61.6	64.7	----
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	----	105	113	----
Toluene-D8	2037-26-5	0.1	%	----	----	110	113	----
4-Bromofluorobenzene	460-00-4	0.1	%	----	----	104	110	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	----	----	96.4	89.2	----
2-Chlorophenol-D4	93951-73-6	0.1	%	----	----	102	93.5	----
2,4,6-Tribromophenol	118-79-6	0.1	%	----	----	82.2	78.7	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	----	----	97.3	92.7	----
Anthracene-d10	1719-06-8	0.1	%	----	----	92.1	87.8	----
4-Terphenyl-d14	1718-51-0	0.1	%	----	----	97.7	93.8	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	109	125	99.6	107	----
Toluene-D8	2037-26-5	0.1	%	114	130	112	115	----
4-Bromofluorobenzene	460-00-4	0.1	%	105	123	101	105	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB65_1.0	MK_SB72_0.5	MK_SB79_0.5	MK_SB78_0.5	TSC2
				07-NOV-2013 10:45	07-NOV-2013 13:20	07-NOV-2013 14:37	07-NOV-2013 16:20	31-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324473-009	ES1324473-011	ES1324473-013	ES1324473-016	ES1324473-018
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	16.8	18.2	25.2	18.0	----
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	----	No	No	No	----
Asbestos Type	1332-21-4	0.1	--	----	-	-	-	----
Sample weight (dry)	----	0.01	g	----	171	279	229	----
APPROVED IDENTIFIER:	----	-	--	----	P.RENNIE	P.RENNIE	P.RENNIE	----
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	----
Arsenic	7440-38-2	5	mg/kg	7	7	<5	8	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	----
Chromium	7440-47-3	2	mg/kg	4	11	6	7	----
Copper	7440-50-8	5	mg/kg	13	15	12	19	----
Lead	7439-92-1	5	mg/kg	16	27	25	18	----
Nickel	7440-02-0	2	mg/kg	10	24	6	35	----
Zinc	7440-66-6	5	mg/kg	19	76	24	54	----
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB65_1.0	MK_SB72_0.5	MK_SB79_0.5	MK_SB78_0.5	TSC2
				07-NOV-2013 10:45	07-NOV-2013 13:20	07-NOV-2013 14:37	07-NOV-2013 16:20	31-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324473-009	ES1324473-011	ES1324473-013	ES1324473-016	ES1324473-018
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<b>115</b>
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<b>128</b>
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<b>84</b>
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	----





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB65_1.0	MK_SB72_0.5	MK_SB79_0.5	MK_SB78_0.5	TSC2
				07-NOV-2013 10:45	07-NOV-2013 13:20	07-NOV-2013 14:37	07-NOV-2013 16:20	31-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324473-009	ES1324473-011	ES1324473-013	ES1324473-016	ES1324473-018
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	1.1
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	20.6
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	3.1
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	13.3
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	5.6
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	43.7
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	18.9
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	85.0	88.8	90.6	97.8	----
2-Chlorophenol-D4	93951-73-6	0.1	%	90.3	93.1	97.6	98.7	----
2,4,6-Tribromophenol	118-79-6	0.1	%	74.6	76.3	79.3	80.8	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	88.0	89.7	90.0	97.5	----
Anthracene-d10	1719-06-8	0.1	%	84.4	82.8	88.5	90.5	----
4-Terphenyl-d14	1718-51-0	0.1	%	90.9	88.5	93.5	96.4	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	83.0	81.8	97.2	83.7	110
Toluene-D8	2037-26-5	0.1	%	104	93.4	114	101	112
4-Bromofluorobenzene	460-00-4	0.1	%	105	101	116	97.7	105

## Analytical Results

### Descriptive Results

Sub-Matrix: SOIL

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>		
EA200: Description	MK_SB49_0.5 - 07-NOV-2013 08:50	Grey-brown soil with some vegetation and small yellow-brown and white rocks and coal pieces
EA200: Description	MK_SB65_0.5 - 07-NOV-2013 15:00	Grey-brown soil with some vegetation and small yellow-brown and white rocks and coal pieces
EA200: Description	MK_SB72_0.5 - 07-NOV-2013 13:20	Grey-brown soil with some vegetation and small yellow-brown and white rocks and coal pieces
EA200: Description	MK_SB79_0.5 - 07-NOV-2013 14:37	Light brown shaly soil with some vegetation
EA200: Description	MK_SB78_0.5 - 07-NOV-2013 16:20	Grey-brown soil with some vegetation and small yellow-brown and white rocks and coal pieces



## Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP066S: PCB Surrogate</b>			
Decachlorobiphenyl	2051-24-3	39	149
<b>EP074S: VOC Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	64	130
Toluene-D8	2037-26-5	66	136
4-Bromofluorobenzene	460-00-4	60	122
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: ES1324473</b>	<b>Page</b>	<b>: 1 of 16</b>
<b>Client</b>	<b>: ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	<b>: Environmental Division Sydney</b>
<b>Contact</b>	<b>: MR JONATHAN LEKAWSKI</b>	<b>Contact</b>	<b>: Barbara Hanna</b>
<b>Address</b>	<b>: GROUND FLOOR</b> <b>33 SAUNDERS STREET, PYRMONT NSW 2009</b> <b>LOCKED BAG 24</b> <b>BROADWAY NSW, AUSTRALIA 2007</b>	<b>Address</b>	<b>: 277-289 Woodpark Road Smithfield NSW Australia 2164</b>
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<b>Project</b>	<b>: PROJECT SYMPHONY-MP</b>	<b>QC Level</b>	<b>: NEPM 2013 Schedule B(3) and ALS QCS3 requirement</b>
<b>Site</b>	<b>: ----</b>	<b>Date Samples Received</b>	<b>: 12-NOV-2013</b>
<b>C-O-C number</b>	<b>: ----</b>	<b>Issue Date</b>	<b>: 19-NOV-2013</b>
<b>Sampler</b>	<b>: TS/GP</b>	<b>No. of samples received</b>	<b>: 18</b>
<b>Order number</b>	<b>: 0207423</b>	<b>No. of samples analysed</b>	<b>: 10</b>
<b>Quote number</b>	<b>: SY/278/13 V3</b>		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

#### Signatories

Celine Conceicao  
Peter Rennie  
Phalak Inthaksone

#### Position

Senior Spectroscopist  
Asbestos Identifier  
Laboratory Manager - Organics

#### Accreditation Category

Sydney Inorganics  
Newcastle - Asbestos  
Sydney Organics



### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :

- Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
- CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
- LOR = Limit of reporting
- RPD = Relative Percentage Difference
- # = Indicates failed QC



## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EA055: Moisture Content (QC Lot: 3161257)</b>									
ES1324460-022	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	24.8	22.5	9.6	0% - 20%
ES1324473-005	D01_071113_TS	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	27.7	31.6	13.0	0% - 20%
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3161227)</b>									
ES1324470-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	11	12	11.5	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	20	21	4.9	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	11	9	15.3	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	22	21	8.6	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	25	22	9.4	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	35	39	8.8	No Limit
ES1324470-016	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	22	25	10.6	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	90	78	13.4	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	20	20	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	16	16	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	24	22	5.4	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	111	96	14.2	0% - 20%
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3161228)</b>									
ES1324470-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1324470-016	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 3156180)</b>									
ES1324476-007	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1324470-019	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3158404)</b>									
ES1324473-004	MK_SB49_0.5	EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074B: Oxygenated Compounds (QC Lot: 3158404)</b>									
ES1324473-004	MK_SB49_0.5	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.0	No Limit
<b>EP074C: Sulfonated Compounds (QC Lot: 3158404)</b>									
ES1324473-004	MK_SB49_0.5	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074D: Fumigants (QC Lot: 3158404)</b>									
ES1324473-004	MK_SB49_0.5	EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3158404)</b>									
ES1324473-004	MK_SB49_0.5	EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.0	No Limit
EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.0	No Limit		



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report							
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)		
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3158404) - continued</b>											
ES1324473-004	MK_SB49_0.5	EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.0	No Limit		
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3158404)</b>											
ES1324473-004	MK_SB49_0.5	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
<b>EP074G: Trihalomethanes (QC Lot: 3158404)</b>											
ES1324473-004	MK_SB49_0.5	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
<b>EP074H: Naphthalene (QC Lot: 3158404)</b>											
ES1324473-004	MK_SB49_0.5	EP074: Naphthalene	91-20-3	5	mg/kg	<5	<5	0.0	No Limit		
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3158392)</b>											
ES1324472-002	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit		
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit		
		ES1324590-001	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
				EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2-Methylphenol	95-48-7			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 2-Nitrophenol	88-75-5			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 2,4-Dimethylphenol	105-67-9			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 2,4-Dichlorophenol	120-83-2			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 2,6-Dichlorophenol	87-65-0			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		



Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3158392) - continued</b>									
ES1324590-001	Anonymous	EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3158392)</b>									
ES1324472-002	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
ES1324590-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		





Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3158392) - continued</b>										
ES1324590-001	Anonymous	EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3158391)</b>										
ES1324472-002	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit	
ES1324590-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3158403)</b>										
ES1324473-004	MK_SB49_0.5	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit	
ES1324511-019	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3159632)</b>										
ES1324511-003	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit	
ES1324511-021	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3158391)</b>										
ES1324472-002	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit	
ES1324590-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	150	170	13.6	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3158403)</b>										
ES1324473-004	MK_SB49_0.5	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit	
ES1324511-019	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3159632)</b>										
ES1324511-003	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit	
ES1324511-021	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit	
<b>EP080: BTEXN (QC Lot: 3158403)</b>										
ES1324473-004	MK_SB49_0.5	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit	
ES1324511-019	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP080: BTEXN (QC Lot: 3158403) - continued</b>									
ES1324511-019	Anonymous	EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3159632)</b>									
ES1324511-003	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES1324511-021	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit



### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3161227)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	112	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	104	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	124	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	109	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	105	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	116	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	106	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	109	81	133	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3161228)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	81.3	66	112	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3156180)</b>									
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	99.4	57.4	117	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3158404)</b>									
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	100	64	126	
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	101	66	128	
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	101	63	129	
EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	101	63	129	
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	104	64	130	
EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	103	63	129	
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	101	63	129	
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	101	62	130	
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	104	61	131	
<b>EP074B: Oxygenated Compounds (QCLot: 3158404)</b>									
EP074: Vinyl Acetate	108-05-4	1	mg/kg	----	10 mg/kg	101	29.6	156	
		5	mg/kg	<5	----	----	----	----	
EP074: 2-Butanone (MEK)	78-93-3	1	mg/kg	----	10 mg/kg	106	58	136	
		5	mg/kg	<5	----	----	----	----	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	1	mg/kg	----	10 mg/kg	99.9	54	138	
		5	mg/kg	<5	----	----	----	----	
EP074: 2-Hexanone (MBK)	591-78-6	1	mg/kg	----	10 mg/kg	101	54	136	
		5	mg/kg	<5	----	----	----	----	
<b>EP074C: Sulfonated Compounds (QCLot: 3158404)</b>									
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	81.9	54	126	
<b>EP074D: Fumigants (QCLot: 3158404)</b>									



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074D: Fumigants (QCLot: 3158404) - continued</b>									
EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	98.4	55	133	
EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	104	69	127	
EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	85.0	54	124	
EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	79.8	51	125	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	97.4	66	126	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3158404)</b>									
EP074: Dichlorodifluoromethane	75-71-8	1	mg/kg	----	10 mg/kg	98.5	30	148	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloromethane	74-87-3	1	mg/kg	----	10 mg/kg	101	41	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Vinyl chloride	75-01-4	1	mg/kg	----	10 mg/kg	101	43	147	
		5	mg/kg	<5	----	----	----	----	
EP074: Bromomethane	74-83-9	1	mg/kg	----	10 mg/kg	102	47	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloroethane	75-00-3	1	mg/kg	----	10 mg/kg	102	49	143	
		5	mg/kg	<5	----	----	----	----	
EP074: Trichlorofluoromethane	75-69-4	1	mg/kg	----	10 mg/kg	102	49	135	
		5	mg/kg	<5	----	----	----	----	
EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	105	54	126	
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	86.5	43	129	
EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	102	62	130	
EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	102	66	132	
EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	101	66	132	
EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	93.6	62	126	
EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	102	64	128	
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	86.7	59	125	
EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	108	65	123	
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	102	64	120	
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	99.3	65	127	
EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	101	70	130	
EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	105	72	128	
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	106	67	143	
EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	80.1	62	122	
EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	93.5	54	128	
EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	99.7	55	129	
EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	100	56	132	
EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	108	65	135	
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	75.2	19.8	134	
EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	74.9	53	129	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3158404) - continued</b>									
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	104	48	136	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3158404)</b>									
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	105	70	128	
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	104	67	127	
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	105	64	130	
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	106	62	130	
EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	105	63	129	
EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	105	63	129	
EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	104	66	128	
EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	101	54	134	
EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	105	60	132	
<b>EP074G: Trihalomethanes (QCLot: 3158404)</b>									
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	101	62	120	
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	79.1	61	121	
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	76.0	63	121	
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	81.6	60	126	
<b>EP074H: Naphthalene (QCLot: 3158404)</b>									
EP074: Naphthalene	91-20-3	0.5	mg/kg	----	1 mg/kg	109	63	133	
		5	mg/kg	<5	----	----	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3158392)</b>									
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	91.4	74	116	
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	87.4	74	116	
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	101	72	116	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	98.5	69	123	
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	79.8	60.3	117	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	83.8	69	117	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	80.4	68	112	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	82.4	73	117	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	85.9	76.4	114	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	73.2	57	111	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	70.2	68.9	112	
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	19.5	3.9	57	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3158392)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	84.6	80	124	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	89.5	77	123	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	87.9	79	123	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	92.4	77	123	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	92.1	79	123	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3158392) - continued</b>									
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	92.5	79	123	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	94.0	79	123	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	95.5	79	125	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	88.2	73	121	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	91.8	81	123	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	87.8	70	118	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	91.0	77	123	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	83.1	76	122	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	76.3	71	113	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	77.0	71.7	113	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	80.5	72.4	114	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3158391)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	90.4	71	131	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	95.4	74	138	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	101	64	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3158403)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	108	68.4	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3159632)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	122	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3158391)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	95.6	70	130	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	96.8	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	
		50	mg/kg	----	150 mg/kg	93.8	63	131	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3158403)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	106	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3159632)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	126	68.4	128	
<b>EP080: BTEXN (QCLot: 3158403)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	101	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	99.6	62	128	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	98.2	58	118	
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	98.8	60	120	
	106-42-3								
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	101	60	120	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	89.4	62	138	
<b>EP080: BTEXN (QCLot: 3159632)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	110	62	116	



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit		Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High
<b>EP080: BTEXN (QCLot: 3159632) - continued</b>								
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	96.7	62	128
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	91.1	58	118
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	91.4	60	120
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	91.4	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	95.0	62	138

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%) Low High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3161227)</b>							
ES1324470-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	113	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	107	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	114	70	130
		EG005T: Copper	7440-50-8	125 mg/kg	112	70	130
		EG005T: Lead	7439-92-1	125 mg/kg	110	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	109	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	105	70	130
		EG005T: Zinc	7440-66-6	125 mg/kg	104	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3161228)</b>							
ES1324470-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	104	70	130
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3156180)</b>							
ES1324476-007	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	110	70	130
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3158404)</b>							
ES1324473-004	MK_SB49_0.5	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	108	70	130
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	112	70	130
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3158404)</b>							
ES1324473-004	MK_SB49_0.5	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	119	70	130
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3158392)</b>							
ES1324472-002	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	77.6	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	79.4	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	67.9	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	77.9	70	130





Sub-Matrix: SOIL

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3158392) - continued</b>							
ES1324472-002	Anonymous	EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	48.5	20	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3158392)</b>							
ES1324472-002	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	76.4	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	82.8	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3158391)</b>							
ES1324472-002	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	75.7	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	77.1	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	69.8	52	132
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3158403)</b>							
ES1324473-004	MK_SB49_0.5	EP080: C6 - C9 Fraction	----	32.5 mg/kg	87.9	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3159632)</b>							
ES1324511-003	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	84.8	70	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3158391)</b>							
ES1324472-002	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	94.2	73	137
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	72.3	53	131
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	56.2	52	132
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3158403)</b>							
ES1324473-004	MK_SB49_0.5	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	86.5	70	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3159632)</b>							
ES1324511-003	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	82.7	70	130
<b>EP080: BTEXN (QCLot: 3158403)</b>							
ES1324473-004	MK_SB49_0.5	EP080: Benzene	71-43-2	2.5 mg/kg	81.1	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	81.1	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	84.6	70	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	84.0	70	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	88.5	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	73.2	70	130
<b>EP080: BTEXN (QCLot: 3159632)</b>							
ES1324511-003	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	77.4	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	82.3	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	74.8	70	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	72.5	70	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	76.2	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	82.2	70	130





### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
					MS	MSD	Low	High	Value	Control Limit	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3156180)</b>											
ES1324476-007	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	110	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3158391)</b>											
ES1324472-002	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	75.7	----	73	137	----	----	
		EP071: C15 - C28 Fraction	----	3140 mg/kg	77.1	----	53	131	----	----	
		EP071: C29 - C36 Fraction	----	2860 mg/kg	69.8	----	52	132	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3158391)</b>											
ES1324472-002	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	94.2	----	73	137	----	----	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	72.3	----	53	131	----	----	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	56.2	----	52	132	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3158392)</b>											
ES1324472-002	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	77.6	----	70	130	----	----	
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	79.4	----	70	130	----	----	
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	67.9	----	60	130	----	----	
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	77.9	----	70	130	----	----	
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	48.5	----	20	130	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3158392)</b>											
ES1324472-002	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	76.4	----	70	130	----	----	
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	82.8	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3158403)</b>											
ES1324473-004	MK_SB49_0.5	EP080: C6 - C9 Fraction	----	32.5 mg/kg	87.9	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3158403)</b>											
ES1324473-004	MK_SB49_0.5	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	86.5	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3158403)</b>											
ES1324473-004	MK_SB49_0.5	EP080: Benzene	71-43-2	2.5 mg/kg	81.1	----	70	130	----	----	
		EP080: Toluene	108-88-3	2.5 mg/kg	81.1	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	84.6	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	84.0	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	88.5	----	70	130	----	----	
	91-20-3	EP080: Naphthalene		2.5 mg/kg	73.2	----	70	130	----	----	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3158404)</b>											
ES1324473-004	MK_SB49_0.5	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	108	----	70	130	----	----	
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	112	----	70	130	----	----	



Sub-Matrix: SOIL

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
					MS	MSD	Low	High	Value	Control Limit	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3158404)</b>											
ES1324473-004	MK_SB49_0.5	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	119	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3159632)</b>											
ES1324511-003	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	84.8	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3159632)</b>											
ES1324511-003	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	82.7	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3159632)</b>											
ES1324511-003	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	77.4	----	70	130	----	----	
		EP080: Toluene	108-88-3	2.5 mg/kg	82.3	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	74.8	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	72.5	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	76.2	----	70	130	----	----	
		EP080: Naphthalene	91-20-3	2.5 mg/kg	82.2	----	70	130	----	----	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3161227)</b>											
ES1324470-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	113	----	70	130	----	----	
		EG005T: Cadmium	7440-43-9	50 mg/kg	107	----	70	130	----	----	
		EG005T: Chromium	7440-47-3	50 mg/kg	114	----	70	130	----	----	
		EG005T: Copper	7440-50-8	125 mg/kg	112	----	70	130	----	----	
		EG005T: Lead	7439-92-1	125 mg/kg	110	----	70	130	----	----	
		EG005T: Nickel	7440-02-0	50 mg/kg	109	----	70	130	----	----	
		EG005T: Selenium	7782-49-2	50 mg/kg	105	----	70	130	----	----	
		EG005T: Zinc	7440-66-6	125 mg/kg	104	----	70	130	----	----	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3161228)</b>											
ES1324470-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	104	----	70	130	----	----	

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1324473</b>	Page	: 1 of 8
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: PROJECT SYMPHONY-MP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 12-NOV-2013
C-O-C number	: ----	Issue Date	: 19-NOV-2013
Sampler	: TS/GP	No. of samples received	: 18
Order number	: 0207423	No. of samples analysed	: 10
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EA055: Moisture Content</b>								
<b>Soil Glass Jar - Unpreserved (EA055-103)</b> MK_SB49_0.5, MK_SB65_1.0, MK_SB79_0.5,	D01_071113_TS, MK_SB72_0.5, MK_SB78_0.5	07-NOV-2013	----	----	----	15-NOV-2013	21-NOV-2013	✓
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
<b>Snap Lock Bag (EA200)</b> MK_SB49_0.5, MK_SB72_0.5, MK_SB78_0.5	MK_SB65_0.5, MK_SB79_0.5,	07-NOV-2013	---	06-MAY-2014	----	19-NOV-2013	18-MAY-2014	✓
<b>EG005T: Total Metals by ICP-AES</b>								
<b>Soil Glass Jar - Unpreserved (EG005T)</b> MK_SB49_0.5, MK_SB65_1.0, MK_SB79_0.5,	D01_071113_TS, MK_SB72_0.5, MK_SB78_0.5	07-NOV-2013	15-NOV-2013	06-MAY-2014	✓	18-NOV-2013	06-MAY-2014	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
<b>Soil Glass Jar - Unpreserved (EG035T)</b> MK_SB49_0.5, MK_SB65_1.0, MK_SB79_0.5,	D01_071113_TS, MK_SB72_0.5, MK_SB78_0.5	07-NOV-2013	15-NOV-2013	05-DEC-2013	✓	18-NOV-2013	05-DEC-2013	✓
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
<b>Soil Glass Jar - Unpreserved (EP066)</b> MK_SB49_0.5,	D01_071113_TS	07-NOV-2013	14-NOV-2013	21-NOV-2013	✓	15-NOV-2013	24-DEC-2013	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
<b>Soil Glass Jar - Unpreserved (EP071)</b> MK_SB49_0.5, MK_SB65_1.0, MK_SB79_0.5,	D01_071113_TS, MK_SB72_0.5, MK_SB78_0.5	07-NOV-2013	14-NOV-2013	21-NOV-2013	✓	15-NOV-2013	24-DEC-2013	✓
<b>EP074D: Fumigants</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB49_0.5,	D01_071113_TS	07-NOV-2013	14-NOV-2013	14-NOV-2013	✓	14-NOV-2013	14-NOV-2013	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Soil Glass Jar - Unpreserved (EP074) MK_SB49_0.5,	D01_071113_TS	07-NOV-2013	14-NOV-2013	14-NOV-2013	✓	14-NOV-2013	14-NOV-2013	✓
<b>EP074F: Halogenated Aromatic Compounds</b>								
Soil Glass Jar - Unpreserved (EP074) MK_SB49_0.5,	D01_071113_TS	07-NOV-2013	14-NOV-2013	14-NOV-2013	✓	14-NOV-2013	14-NOV-2013	✓
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Soil Glass Jar - Unpreserved (EP074) MK_SB49_0.5,	D01_071113_TS	07-NOV-2013	14-NOV-2013	14-NOV-2013	✓	14-NOV-2013	14-NOV-2013	✓
<b>EP074H: Naphthalene</b>								
Soil Glass Jar - Unpreserved (EP074) MK_SB49_0.5,	D01_071113_TS	07-NOV-2013	14-NOV-2013	14-NOV-2013	✓	14-NOV-2013	14-NOV-2013	✓
<b>EP074B: Oxygenated Compounds</b>								
Soil Glass Jar - Unpreserved (EP074) MK_SB49_0.5,	D01_071113_TS	07-NOV-2013	14-NOV-2013	14-NOV-2013	✓	14-NOV-2013	14-NOV-2013	✓
<b>EP074C: Sulfonated Compounds</b>								
Soil Glass Jar - Unpreserved (EP074) MK_SB49_0.5,	D01_071113_TS	07-NOV-2013	14-NOV-2013	14-NOV-2013	✓	14-NOV-2013	14-NOV-2013	✓
<b>EP074G: Trihalomethanes</b>								
Soil Glass Jar - Unpreserved (EP074) MK_SB49_0.5,	D01_071113_TS	07-NOV-2013	14-NOV-2013	14-NOV-2013	✓	14-NOV-2013	14-NOV-2013	✓
<b>EP075(SIM)A: Phenolic Compounds</b>								
Soil Glass Jar - Unpreserved (EP075(SIM)) MK_SB49_0.5, MK_SB65_1.0, MK_SB79_0.5,	D01_071113_TS, MK_SB72_0.5, MK_SB78_0.5	07-NOV-2013	14-NOV-2013	21-NOV-2013	✓	15-NOV-2013	24-DEC-2013	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Soil Glass Jar - Unpreserved (EP075(SIM)) MK_SB49_0.5, MK_SB65_1.0, MK_SB79_0.5,	D01_071113_TS, MK_SB72_0.5, MK_SB78_0.5	07-NOV-2013	14-NOV-2013	21-NOV-2013	✓	15-NOV-2013	24-DEC-2013	✓
<b>EP080: BTEXN</b>								
Soil Glass Jar - Unpreserved (EP080) TRIP BLANK		04-NOV-2013	15-NOV-2013	18-NOV-2013	✓	15-NOV-2013	18-NOV-2013	✓
Soil Glass Jar - Unpreserved (EP080) MK_SB49_0.5,	D01_071113_TS	07-NOV-2013	14-NOV-2013	21-NOV-2013	✓	14-NOV-2013	21-NOV-2013	✓
Soil Glass Jar - Unpreserved (EP080) MK_SB65_1.0, MK_SB79_0.5,	MK_SB72_0.5, MK_SB78_0.5	07-NOV-2013	15-NOV-2013	21-NOV-2013	✓	15-NOV-2013	21-NOV-2013	✓
Soil Glass Jar - Unpreserved (EP080) TRIP SPIKE 2,	TSC2	31-OCT-2013	14-NOV-2013	14-NOV-2013	✓	14-NOV-2013	14-NOV-2013	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP080/071: Total Petroleum Hydrocarbons</b>							
<b>Soil Glass Jar - Unpreserved (EP080)</b> TRIP BLANK	04-NOV-2013	15-NOV-2013	18-NOV-2013	✓	15-NOV-2013	18-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB49_0.5, D01_071113_TS	07-NOV-2013	14-NOV-2013	21-NOV-2013	✓	14-NOV-2013	21-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB65_1.0, MK_SB72_0.5, MK_SB79_0.5, MK_SB78_0.5	07-NOV-2013	15-NOV-2013	21-NOV-2013	✓	15-NOV-2013	21-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> TRIP SPIKE 2, TSC2	31-OCT-2013	14-NOV-2013	14-NOV-2013	✓	14-NOV-2013	14-NOV-2013	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Moisture Content	EA055-103	2	17	11.8	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	17	11.8	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	4	31	12.9	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	10	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	31	6.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	10	10.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	31	6.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	10	10.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	31	6.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	10	10.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Asbestos Identification in bulk solids	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
TPH - Semivolatle Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (2013) Schedule B(3) (Method 506.1)
Volatile Organic Compounds	EP074	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option A - Concentrating)	ORG17A	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.



Page : 7 of 8  
Work Order : ES1324473  
Client : ENVIRO RESOURCES MANAGEMENT  
Project : PROJECT SYMPHONY-MP



<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.



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## Summary of Outliers

### **Outliers : Quality Control Samples**

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### **Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes**

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.
- For all matrices, no Matrix Spike outliers occur.

#### **Regular Sample Surrogates**

- For all regular sample matrices, no surrogate recovery outliers occur.

### **Outliers : Analysis Holding Time Compliance**

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- No Analysis Holding Time Outliers exist.

### **Outliers : Frequency of Quality Control Samples**

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.
-

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

<b>Work Order</b> : <b>ES1324473</b>	
<b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : MR JONATHAN LEKAWSKI <b>Address</b> : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Laboratory</b> : Environmental Division Sydney  <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b> : jonathan.lekawski@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800	<b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555
<b>Project</b> : PROJECT SYMPHONY-MP <b>Order number</b> : 0207423 <b>C-O-C number</b> : ---- <b>Site</b> : ---- <b>Sampler</b> : TS/GP	<b>Page</b> : 1 of 3  <b>Quote number</b> : ES2013ENVRES0370 (SY/278/13 V3)  <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement

#### Dates

<b>Date Samples Received</b> : 12-NOV-2013 <b>Client Requested Due Date</b> : 19-NOV-2013	<b>Issue Date</b> : 13-NOV-2013 10:38 <b>Scheduled Reporting Date</b> : <b>19-NOV-2013</b>
--	---

#### Delivery Details

<b>Mode of Delivery</b> : Carrier <b>No. of coolers/boxes</b> : 1 HARD <b>Security Seal</b> : Intact.	<b>Temperature</b> : 8.3°C - Ice present <b>No. of samples received</b> : 18 <b>No. of samples analysed</b> : 10
---	--

#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Asbestos analysis will be conducted by ALS Newcastle.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Sample T01\_071113\_TS will be forwarded to Envirolab as per COC.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- No sample container / preservation non-compliance exist.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL	No analysis requested	SOIL - EA200	Asbestos Identification in Soils	SOIL - EG005T (solids)	Total Metals by ICP-AES	SOIL - EP066 (solids)	Polychlorinated Biphenyls by GC/MS	SOIL - EP074 (solids)	Volatile Organic Compounds	SOIL - S-18 (NO MOIST)	TRH(C6-C9)/BTEXN with No Moisture	SOIL - S-27	TRH/BTEXN/PAH/Phenols/8Metals
ES1324473-001	31-OCT-2013 15:00	TRIP SPIKE 2											✓			
ES1324473-002	04-NOV-2013 15:00	TRIP BLANK											✓			
ES1324473-003	07-NOV-2013 08:45	MK_SB49_0.2	✓													
ES1324473-004	07-NOV-2013 08:50	MK_SB49_0.5			✓	✓	✓	✓	✓	✓						✓
ES1324473-005	07-NOV-2013 15:00	D01_071113_TS					✓	✓	✓	✓						✓
ES1324473-006	07-NOV-2013 09:20	MK_SB49_0.9	✓													
ES1324473-007	07-NOV-2013 10:15	MK_SB65_0.2	✓													
ES1324473-008	07-NOV-2013 15:00	MK_SB65_0.5			✓											
ES1324473-009	07-NOV-2013 10:45	MK_SB65_1.0					✓									✓
ES1324473-010	07-NOV-2013 13:10	MK_SB72_0.2	✓													
ES1324473-011	07-NOV-2013 13:20	MK_SB72_0.5			✓	✓										✓
ES1324473-012	07-NOV-2013 14:31	MK_SB79_0.2	✓													
ES1324473-013	07-NOV-2013 14:37	MK_SB79_0.5			✓	✓										✓
ES1324473-014	07-NOV-2013 15:00	MK_SB79_0.9	✓													
ES1324473-015	07-NOV-2013 16:13	MK_SB78_0.2	✓													
ES1324473-016	07-NOV-2013 16:20	MK_SB78_0.5			✓	✓										✓
ES1324473-017	07-NOV-2013 16:45	MK_SB78_1.0	✓													
ES1324473-018	31-OCT-2013 15:00	TSC2											✓			

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com



# CHAIN OF CUSTODY

CHAPLAIN 21 Burns Road, Forster SA 5095  
 Ph: 08 8339 0800 E: chlain@alslab.com  
 CHASSISMAN 32 Street Street, Stirling QLD 4053  
 Ph: 07 3243 7222 E: samples.stirling@alslab.com  
 DGLADSTONE 46 Calhoun Drive, Yarrhon QLD 4000  
 Ph: 07 471 5500 E: samples.gladstone@alslab.com

DIACKAY 78 Harbour Road, Mackay QLD 4730  
 Ph: 07 4944 0177 E: mackay@alslab.com  
 DINGBOURNE 24 Westall Road, Springvale VIC 3171  
 Ph: 03 8548 9500 E: samples.melbourn@alslab.com  
 DUNDIGEE 27 Sydney Road, Mullago NSW 2550  
 Ph: 02 6972 0738 E: mullago@alslab.com

DINEWICKVILLE 5 Rose Gum Road, Warracknabeal NSW 2904  
 Ph: 02 4688 4403 E: warracknabeal@alslab.com  
 GUNOWRA 4713 Geary Place, North Maitland NSW 2341  
 Ph: 025423 2033 E: northmaitland@alslab.com  
 LUPERTH 10 Hood Way, Malaga WA 6150  
 Ph: 08 9208 7055 E: samples.perth@alslab.com

LESTON 277-289 Woodcock Road, Smithfield NSW 2164  
 Ph: 02 8156 6505 E: smithfield@alslab.com  
 TOWNSVILLE 14-15 Deanna Court, Bohle QLD 4818  
 Ph: 07 4266 6200 E: townsville@alslab.com

Environmental Division  
 Sydney  
 Work Order  
**ES1322473**

CLIENT: ERM  
 OFFICE: Sydney  
 PROJECT: Project Symphony - MP  
 ORDER NUMBER: 0207423  
 PROJECT MANAGER: Jonathan Lektawski  
 SAMPLES: Thiavone Shavy, Gavin Powell  
 COC emailed to ALST: YES / (NO)  
 Email Reports to (will default to PM if no other addresses are listed): Symphony, DeliaWest@erm.com  
 Email Invoice to (will default to PM if no other addresses are listed): Symphony, DeliaWest@erm.com

TURNAROUND REQUIREMENTS:  
 Standard TAT (List due date):  
 Non Standard or urgent TAT (List due date):  
 (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)  
 ALS QUOTE NO.: SY/278713  
 CONTRACT PH: 0425 660035  
 EDD FORMAT (or default): pdf/esv/est  
 RELINQUISHED BY: Thiavone Shavy  
 DATE/TIME: 11.11.13/15:00  
 RECEIVED BY: De-  
 DATE/TIME: 12/11 08:53  
 COC SEQUENCE NUMBER (Grid):  
 OF: 1 2 3 4 5 6 7  
 RELINQUISHED BY: [Signature]  
 DATE/TIME: [Blank]

FOR LABORATORY:  
 Custody Sealing  
 Random Sample  
 Other Comments

Barcode: ES1322473  
 Telephone: +61-2-8784 8555

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below	TOTAL CONTAINERS	ANALYSIS REQUIRED INCLUDING SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)										Additional Information	
						S-27 (8 metals - As, Cd, Cr, Cu, Ni, Pb, Zn, Hg, TRH/BTEX, PAH/Phenols)	Additional Metal - Se	TRH / BTEX / PAH / Phenol	Asbestos	VOC Scan	PCB	Particle Sizing (hydrometer), TOC - (potter method)	pH, Exchangeable Cations plus ECEC				
1	Tipspike 2	31.10.13	Soil	jar	1	X	X	X	X	X	X	X	X	X	X		
2	Tip Blank	4.11.13	"	"	1	X	X	X	X	X	X	X	X	X	X		
3	MK-SB49-02	7.11.13/0845		1 bag jar	2	X	X	X	X	X	X	X	X	X	X		HOLD
4	MK-SB49-0.5	08:50		1 bag jar	2	X	X	X	X	X	X	X	X	X	X		
5	DOI-071113-TS			1 jar	1	X	X	X	X	X	X	X	X	X	X		
6	TD1-071113-TS			1 jar	1	X	X	X	X	X	X	X	X	X	X		
7	MK-SB49-0.2	09:20		1 bag jar	1	X	X	X	X	X	X	X	X	X	X		HOLD
8	MK-SB65-0.2	10:15		1 bag jar	2	X	X	X	X	X	X	X	X	X	X		HOLD
9	MK-SB65-0.5	-		1 jar	1	X	X	X	X	X	X	X	X	X	X		
10	MK-SB65-1.0	10:45		1 jar	1	X	X	X	X	X	X	X	X	X	X		
11	MK-SB72-0.2	13:10		1 jar, 1 bag	2	X	X	X	X	X	X	X	X	X	X		HOLD
	MK-SB72-0.5	13:20		1 jar, 1 bag	2	X	X	X	X	X	X	X	X	X	X		
<b>TOTAL</b>						19	5	5	5	3	3	3	3	3	3		2

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; ST = Sodium Hydroxide Preserved Plastic; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Air-tight Unpreserved Plastic  
 V = VOA Vial (HCl Preserved); VB = VOA Vial Sodium Bisulfate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Air-tight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Specimen Bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass  
 Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Solids; B = Unpreserved Bag

**ALS CHAIN OF CUSTODY**  
**Environmental**  
 ALS Laboratory:  
 please look →

DADELAND: 21 Burma Road, Porosola SA 5005  
 Ph: 08 8359 0890 E: dadeland@alsglobal.com  
 DARFISBANE: 32 Strand Street, Surfcoast QLD 4053  
 Ph: 07 3243 7222 E: sarah@alsglobal.com  
 DELAWARE: 46 Callimorrah Drive, Clinton QLD 4860  
 Ph: 07 471 5800 E: gordon@alsglobal.com  
 DUMACKAY: 78 Harbour Road, Mackay QLD 4740  
 Ph: 07 4844 0177 E: mackay@alsglobal.com  
 DUNEBOURNE: 24 Visceral Road, Springvale VIC 3171  
 Ph: 03 8598 8800 E: sarah@alsglobal.com  
 DUNEDIN: 27 Sydney Road, Mudgee NSW 2860  
 Ph: 02 6972 8735 E: mudgee@alsglobal.com  
 DUNEDIN: 5 Rose Gum Road, Warrumbungle NSW 2204  
 Ph: 02 4096 9433 E: sam@alsglobal.com  
 DUNEDIN: 413 Geary Place, North Nowra NSW 2541  
 Ph: 02 4423 2803 E: nowra@alsglobal.com  
 DUNEDIN: 10 Had Way, Malaga WA 6090  
 Ph: 08 9209 7855 E: sample@alsglobal.com  
 DUNEDIN: 277 280 Woodpeck Road, Smithfield NSW 2184  
 Ph: 02 8794 8835 E: smithfield@alsglobal.com  
 DUNEDIN: 14-15 Deanna Court, Botho QLD 4818  
 Ph: 07 4780 0800 E: townsville@alsglobal.com  
 DUNEDIN: 89 Kenny Street, Wollongong NSW 2500  
 Ph: 02 4225 3125 E: perth@alsglobal.com

**CLIENT:** ERM  
**OFFICE:** Sydney  
**PROJECT:** Project Symphony - MP  
**ORDER NUMBER:** 0207423  
**PROJECT MANAGER:** Jonathan Lekawski  
**SAMPLER:** Thavone Shaw, Gavin Powell  
**COC emailed to:** ALS71 YES / NO  
**Email Reports to:** (will default to PM if no other addresses are listed): Symphony.DeltaWest@erm.com  
**Email Invoice to:** (will default to PM if no other addresses are listed): Symphony.DeltaWest@erm.com

**TURNAROUND REQUIREMENTS:**  Standard TAT (list due date):  
 Non Standard or urgent TAT (list due date):  
**ALIS QUOTE NO.:** SY/27813  
**RELINQUISHED BY:** Thavone Shaw  
**DATE/TIME:** 11.11.13 / 15:00  
**RECEIVED BY:** Denny  
**DATE/TIME:** 12/11 08:30

**RELINQUISHED BY:** Thavone Shaw  
**DATE/TIME:** 11.11.13 / 15:00  
**RECEIVED BY:** Denny  
**DATE/TIME:** 12/11 08:30

**FOR LABORATORY USE ONLY (COCs)**  
 Certificate Serial Number? Yes No N/A  
 Random Sample Temperature on Receipt? Yes No N/A  
 Other Comments?

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (codes below)	TOTAL CONTAINERS	ANALYSIS REQUIRED INCLUDING SUITES (NB: Suite Codes must be listed to attract suite price) where Metals are required, specify Total (undiluted bottle required) or Dissolved (field filtered bottle required).										Additional Information	
						S-27 (8 metals - As, Cd, Cr, Cu, Ni, Pb, Zn, Hg, TRH/BTEX, PAH/Phenols)	Additional Metal - Se	TRH / BTEX / PAH / Phenol	Asbestos	VOC Scan	PCB	Particle Sizing (hydrometer), TOC -	pH, Exchangeable Cations plus ECEC	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.			
12	MKS-879-02	7.11.13	Soil	1 bag 1 jar	2	X	X	X									HOLD
13	MK-S879-0.5	14:57	"	1 jar	1	X	X	X									HOLD
14	MK-S879-0.9	15:00	"	1 jar	1	X	X	X									HOLD
15	MK-S878-0.2	16:13	"	1 jar 1 bag	2	X	X	X									HOLD
16	MK-S878-0.5	16:20	"	"	2	X	X	X									HOLD
17	MK-S878-1.0	16:45	"	1 jar	1	X	X	X									HOLD
<b>TOTAL</b>																	

Water Container Codes: F = Unpreserved Plastic; K = Nitric Preserved Plastic; ORG = Nitric Preserved ORG; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airtight Unpreserved Plastic  
 V = VOA Via KCl Preserved; VB = VOA Via Sodium Bisulphate Preserved; VS = VOA Via Sulfuric Preserved; AV = Airtight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;  
 Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Solids; B = Unpreserved Bag.







## CERTIFICATE OF ANALYSIS

Work Order	: <b>ES1324716</b>	Page	: 1 of 14
Client	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
Contact	: SYMPHONY DELTAWEST	Contact	: Barbara Hanna
Address	: GRND FLOOR, 33 SAUNDERS STREET PYRMONT NSW AUSTRALIA 2009	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: symphony.deltawest@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: PROJECT SYMPHONY - MP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 0207423	Date Samples Received	: 14-NOV-2013
C-O-C number	: ----	Issue Date	: 26-NOV-2013
Sampler	: TS, GP	No. of samples received	: 19
Site	: ----	No. of samples analysed	: 9
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EA200 Legend**
- **EA200 'Am' Amosite (brown asbestos)**
- **EA200 'Ch' Chrysotile (white asbestos)**
- **EA200 'Cr' Crocidolite (blue asbestos)**
- **EA200 'Trace' - Asbestos fibres detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres**
- **EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.**
- **EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.**
- **EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.**



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<u>Signatories</u>	<u>Position</u>	<u>Accreditation Category</u>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Inorganics
		Sydney Organics
Shaun Spooner	Laboratory Technician	Newcastle - Asbestos



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				MA_MW01_0.5	MK_SB42_0.4	MA_MW03_0.5	MK_SB30_0.5	MK_SB24_0.4
				11-NOV-2013 13:50	11-NOV-2013 16:55	11-NOV-2013 15:35	12-NOV-2013 10:20	12-NOV-2013 11:25
Compound	CAS Number	LOR	Unit	ES1324716-001	ES1324716-002	ES1324716-003	ES1324716-004	ES1324716-005
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	22.2	11.7	21.1	13.0	11.2
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No
Asbestos Type	1332-21-4	0.1	--	-	-	-	-	-
Sample weight (dry)	----	0.01	g	370	277	469	157	142
APPROVED IDENTIFIER:	----	-	--	S.SPOONER	S.SPOONER	S.SPOONER	S.SPOONER	S.SPOONER
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	6	17	8	6	6
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	<2	9	<2	<2	3
Copper	7440-50-8	5	mg/kg	7	27	<5	6	8
Lead	7439-92-1	5	mg/kg	12	24	10	12	13
Nickel	7440-02-0	2	mg/kg	8	76	9	5	14
Zinc	7440-66-6	5	mg/kg	33	93	35	29	23
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	----	<0.1	----	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	<0.5	----	<0.5	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	----	<0.5	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	----	<0.5	----	----
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	----	<0.5	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	----	<0.5	----	----
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	----	<0.5	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	----	<0.5	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	----	<0.5	----	----
n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	----	<0.5	----	----
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	<5	----	<5	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	----	<5	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	----	<5	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MA_MW01_0.5	MK_SB42_0.4	MA_MW03_0.5	MK_SB30_0.5	MK_SB24_0.4
				11-NOV-2013 13:50	11-NOV-2013 16:55	11-NOV-2013 15:35	12-NOV-2013 10:20	12-NOV-2013 11:25
Compound	CAS Number	LOR	Unit	ES1324716-001	ES1324716-002	ES1324716-003	ES1324716-004	ES1324716-005
<b>EP074B: Oxygenated Compounds - Continued</b>								
2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	----	<5	----	----
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	----	<0.5	----	----
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	----	<0.5	----	----
1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	----	<0.5	----	----
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	----	<0.5	----	----
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	----	<0.5	----	----
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	----	<0.5	----	----
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	----	<5	----	----
Chloromethane	74-87-3	5	mg/kg	<5	----	<5	----	----
Vinyl chloride	75-01-4	5	mg/kg	<5	----	<5	----	----
Bromomethane	74-83-9	5	mg/kg	<5	----	<5	----	----
Chloroethane	75-00-3	5	mg/kg	<5	----	<5	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg	<5	----	<5	----	----
1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	----	<0.5	----	----
Iodomethane	74-88-4	0.5	mg/kg	<0.5	----	<0.5	----	----
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	----	<0.5	----	----
1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	----	<0.5	----	----
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	----	<0.5	----	----
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	----	<0.5	----	----
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	----	<0.5	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	----	<0.5	----	----
1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	----	<0.5	----	----
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	----	<0.5	----	----
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	----	<0.5	----	----
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	----	<0.5	----	----
1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	----	<0.5	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	----	<0.5	----	----
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	----	<0.5	----	----
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	----	<0.5	----	----
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	----	<0.5	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MA_MW01_0.5	MK_SB42_0.4	MA_MW03_0.5	MK_SB30_0.5	MK_SB24_0.4
				11-NOV-2013 13:50	11-NOV-2013 16:55	11-NOV-2013 15:35	12-NOV-2013 10:20	12-NOV-2013 11:25
Compound	CAS Number	LOR	Unit	ES1324716-001	ES1324716-002	ES1324716-003	ES1324716-004	ES1324716-005
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	----	<0.5	----	----
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	----	<0.5	----	----
Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	----	<0.5	----	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	----	<0.5	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	----	<0.5	----	----
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	----	<0.5	----	----
Bromobenzene	108-86-1	0.5	mg/kg	<0.5	----	<0.5	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	----	<0.5	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	----	<0.5	----	----
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	----	<0.5	----	----
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	----	<0.5	----	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	----	<0.5	----	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	----	<0.5	----	----
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	----	<0.5	----	----
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	<0.5	----	<0.5	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	----	<0.5	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	----	<0.5	----	----
Bromoform	75-25-2	0.5	mg/kg	<0.5	----	<0.5	----	----
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	5	mg/kg	<5	----	<5	----	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MA_MW01_0.5	MK_SB42_0.4	MA_MW03_0.5	MK_SB30_0.5	MK_SB24_0.4
				11-NOV-2013 13:50	11-NOV-2013 16:55	11-NOV-2013 15:35	12-NOV-2013 10:20	12-NOV-2013 11:25
Compound	CAS Number	LOR	Unit	ES1324716-001	ES1324716-002	ES1324716-003	ES1324716-004	ES1324716-005
<b>EP075(SIM)A: Phenolic Compounds - Continued</b>								
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	0.8	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	0.6	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	1.4	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	1.2	1.2	1.2
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	<50



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MA_MW01_0.5	MK_SB42_0.4	MA_MW03_0.5	MK_SB30_0.5	MK_SB24_0.4
				11-NOV-2013 13:50	11-NOV-2013 16:55	11-NOV-2013 15:35	12-NOV-2013 10:20	12-NOV-2013 11:25
Compound	CAS Number	LOR	Unit	ES1324716-001	ES1324716-002	ES1324716-003	ES1324716-004	ES1324716-005
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 - Continued</b>								
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	66.3	----	66.4	----	----
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	86.9	----	96.3	----	----
Toluene-D8	2037-26-5	0.1	%	90.4	----	99.1	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	88.4	----	93.4	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	104	104	110	105	102
2-Chlorophenol-D4	93951-73-6	0.1	%	107	109	120	106	106
2,4,6-Tribromophenol	118-79-6	0.1	%	82.2	89.2	78.5	83.4	83.5
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	106	98.6	86.3	96.1	94.4
Anthracene-d10	1719-06-8	0.1	%	89.7	90.9	94.6	95.5	91.7
4-Terphenyl-d14	1718-51-0	0.1	%	116	99.3	101	104	99.2
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	89.5	104	99.1	111	109
Toluene-D8	2037-26-5	0.1	%	85.6	98.5	94.0	99.9	99.1
4-Bromofluorobenzene	460-00-4	0.1	%	86.0	97.7	92.2	101	96.0





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB71_0.5	MA_MW05_0.1	MA_MW08_0.2	MA_MW08_0.5	----
				12-NOV-2013 13:55	12-NOV-2013 15:10	12-NOV-2013 15:50	12-NOV-2013 16:00	----
Compound	CAS Number	LOR	Unit	ES1324716-006	ES1324716-007	ES1324716-008	ES1324716-009	----
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	13.7	11.1	14.0	23.5	----
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	----	----
Asbestos Type	1332-21-4	0.1	--	-	-	-	----	----
Sample weight (dry)	----	0.01	g	201	173	150	----	----
APPROVED IDENTIFIER:	----	-	--	S.SPOONER	S.SPOONER	S.SPOONER	----	----
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	----
Arsenic	7440-38-2	5	mg/kg	12	18	8	21	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	----
Chromium	7440-47-3	2	mg/kg	14	20	10	15	----
Copper	7440-50-8	5	mg/kg	22	24	<5	5	----
Lead	7439-92-1	5	mg/kg	28	33	14	12	----
Nickel	7440-02-0	2	mg/kg	39	77	8	<2	----
Zinc	7440-66-6	5	mg/kg	79	114	12	9	----
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	----
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	0.1	mg/kg	----	<0.1	<0.1	<0.1	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
Isopropylbenzene	98-82-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
n-Propylbenzene	103-65-1	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
n-Butylbenzene	104-51-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	----	<5	<5	<5	----
2-Butanone (MEK)	78-93-3	5	mg/kg	----	<5	<5	<5	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	----	<5	<5	<5	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				MK_SB71_0.5	MA_MW05_0.1	MA_MW08_0.2	MA_MW08_0.5	----
				12-NOV-2013 13:55	12-NOV-2013 15:10	12-NOV-2013 15:50	12-NOV-2013 16:00	----
Compound	CAS Number	LOR	Unit	ES1324716-006	ES1324716-007	ES1324716-008	ES1324716-009	----
<b>EP074B: Oxygenated Compounds - Continued</b>								
2-Hexanone (MBK)	591-78-6	5	mg/kg	----	<5	<5	<5	----
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1,2-Dichloropropane	78-87-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	----	<5	<5	<5	----
Chloromethane	74-87-3	5	mg/kg	----	<5	<5	<5	----
Vinyl chloride	75-01-4	5	mg/kg	----	<5	<5	<5	----
Bromomethane	74-83-9	5	mg/kg	----	<5	<5	<5	----
Chloroethane	75-00-3	5	mg/kg	----	<5	<5	<5	----
Trichlorofluoromethane	75-69-4	5	mg/kg	----	<5	<5	<5	----
1,1-Dichloroethene	75-35-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
Iodomethane	74-88-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1,1-Dichloroethane	75-34-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1,2-Dichloroethane	107-06-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
Trichloroethene	79-01-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
Dibromomethane	74-95-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1,3-Dichloropropane	142-28-9	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
Tetrachloroethene	127-18-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB71_0.5	MA_MW05_0.1	MA_MW08_0.2	MA_MW08_0.5	----
				12-NOV-2013 13:55	12-NOV-2013 15:10	12-NOV-2013 15:50	12-NOV-2013 16:00	----
Compound	CAS Number	LOR	Unit	ES1324716-006	ES1324716-007	ES1324716-008	ES1324716-009	----
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
Pentachloroethane	76-01-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
Bromobenzene	108-86-1	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
2-Chlorotoluene	95-49-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
4-Chlorotoluene	106-43-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
Bromodichloromethane	75-27-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
Dibromochloromethane	124-48-1	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
Bromoform	75-25-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	5	mg/kg	----	<5	<5	<5	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB71_0.5	MA_MW05_0.1	MA_MW08_0.2	MA_MW08_0.5	----
				12-NOV-2013 13:55	12-NOV-2013 15:10	12-NOV-2013 15:50	12-NOV-2013 16:00	----
Compound	CAS Number	LOR	Unit	ES1324716-006	ES1324716-007	ES1324716-008	ES1324716-009	----
<b>EP075(SIM)A: Phenolic Compounds - Continued</b>								
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	----
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	----
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB71_0.5	MA_MW05_0.1	MA_MW08_0.2	MA_MW08_0.5	----
				12-NOV-2013 13:55	12-NOV-2013 15:10	12-NOV-2013 15:50	12-NOV-2013 16:00	----
Compound	CAS Number	LOR	Unit	ES1324716-006	ES1324716-007	ES1324716-008	ES1324716-009	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 - Continued</b>								
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	----
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	----
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	----	64.0	61.4	60.2	----
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	106	105	91.1	----
Toluene-D8	2037-26-5	0.1	%	----	106	103	91.7	----
4-Bromofluorobenzene	460-00-4	0.1	%	----	103	101	95.8	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	95.9	81.0	104	105	----
2-Chlorophenol-D4	93951-73-6	0.1	%	102	83.8	107	106	----
2,4,6-Tribromophenol	118-79-6	0.1	%	75.6	59.2	88.1	77.6	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	91.1	76.0	93.6	94.2	----
Anthracene-d10	1719-06-8	0.1	%	96.4	72.0	92.6	89.7	----
4-Terphenyl-d14	1718-51-0	0.1	%	95.2	80.0	105	98.9	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	109	109	108	93.8	----
Toluene-D8	2037-26-5	0.1	%	99.2	100	98.1	86.9	----
4-Bromofluorobenzene	460-00-4	0.1	%	101	102	98.8	95.2	----



## Analytical Results

### Descriptive Results

Sub-Matrix: **SOIL**

<i>Method: Compound</i>	<i>Client sample ID - Client sampling date / time</i>	<i>Analytical Results</i>
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>		
EA200: Description	MA_MW01_0.5 - 11-NOV-2013 13:50	Mid grey - brown clay soil with dark grey rocks plus a trace of vegetation.
EA200: Description	MK_SB42_0.4 - 11-NOV-2013 16:55	Mid grey - brown clay soil with grey rocks plus a trace of vegetation.
EA200: Description	MA_MW03_0.5 - 11-NOV-2013 15:35	Pale grey - brown clay soil with grey rocks and quartz grains plus a trace of vegetation.
EA200: Description	MK_SB30_0.5 - 12-NOV-2013 10:20	Mid grey - brown clay soil with grey and orange rocks plus a trace of vegetation.
EA200: Description	MK_SB24_0.4 - 12-NOV-2013 11:25	Mid grey clay soil with dark grey rocks and quartz grains plus a trace of vegetation.
EA200: Description	MK_SB71_0.5 - 12-NOV-2013 13:55	Mid grey clay soil with grey and orange rocks plus a trace of vegetation.
EA200: Description	MA_MW05_0.1 - 12-NOV-2013 15:10	Mid grey - brown clay soil with grey and red rocks plus a trace of vegetation.
EA200: Description	MA_MW08_0.2 - 12-NOV-2013 15:50	Pale brown clay soil with grey and orange rocks plus a trace of vegetation.



## Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP066S: PCB Surrogate</b>			
Decachlorobiphenyl	2051-24-3	39	149
<b>EP074S: VOC Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	64	130
Toluene-D8	2037-26-5	66	136
4-Bromofluorobenzene	460-00-4	60	122
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

## QUALITY CONTROL REPORT

Work Order	: <b>ES1324716</b>	Page	: 1 of 16
Client	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
Contact	: SYMPHONY DELTAWEST	Contact	: Barbara Hanna
Address	: GRND FLOOR, 33 SAUNDERS STREET PYRMONT NSW AUSTRALIA 2009	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: symphony.deltawest@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: PROJECT SYMPHONY - MP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 14-NOV-2013
C-O-C number	: ----	Issue Date	: 26-NOV-2013
Sampler	: TS, GP	No. of samples received	: 19
Order number	: 0207423	No. of samples analysed	: 9
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits





## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :  
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
RPD = Relative Percentage Difference  
# = Indicates failed QC



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

## Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Inorganics Sydney Organics
Shaun Spooner	Laboratory Technician	Newcastle - Asbestos



## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EA055: Moisture Content (QC Lot: 3167932)</b>									
EB1328176-003	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	29.2	28.9	0.8	0% - 20%
EB1328176-014	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	33.1	33.6	1.7	0% - 20%
<b>EA055: Moisture Content (QC Lot: 3167933)</b>									
ES1324716-006	MK_SB71_0.5	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	13.7	12.1	12.4	0% - 50%
ES1324724-008	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	14.8	15.0	1.6	0% - 50%
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3167577)</b>									
ES1324716-001	MA_MW01_0.5	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	<2	3	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	8	12	40.6	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	7	8	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	12	13	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	33	39	18.0	No Limit
ES1324724-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	11	10	10.5	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	2	3	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	7	5	32.4	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	10	8	19.8	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	10	15	39.5	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3167578)</b>									
ES1324716-001	MA_MW01_0.5	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1324724-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 3166266)</b>									
ES1324722-002	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1324729-008	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3166953)</b>									
ES1324716-001	MA_MW01_0.5	EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3166953) - continued</b>									
ES1324716-001	MA_MW01_0.5	EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1325013-002	Anonymous	EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074B: Oxygenated Compounds (QC Lot: 3166953)</b>									
ES1324716-001	MA_MW01_0.5	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.0	No Limit
ES1325013-002	Anonymous	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.0	No Limit
<b>EP074C: Sulfonated Compounds (QC Lot: 3166953)</b>									
ES1324716-001	MA_MW01_0.5	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1325013-002	Anonymous	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074D: Fumigants (QC Lot: 3166953)</b>									
ES1324716-001	MA_MW01_0.5	EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1325013-002	Anonymous	EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3166953)</b>									
ES1324716-001	MA_MW01_0.5	EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3166953) - continued</b>									
ES1324716-001	MA_MW01_0.5	EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.0	No Limit
ES1325013-002	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3166953) - continued</b>									
ES1325013-002	Anonymous	EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.0	No Limit
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.0	No Limit		
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3166953)</b>									
ES1324716-001	MA_MW01_0.5	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1325013-002	Anonymous	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074G: Trihalomethanes (QC Lot: 3166953)</b>									
ES1324716-001	MA_MW01_0.5	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1325013-002	Anonymous	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074H: Naphthalene (QC Lot: 3166953)</b>									



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074H: Naphthalene (QC Lot: 3166953) - continued</b>									
ES1324716-001	MA_MW01_0.5	EP074: Naphthalene	91-20-3	5	mg/kg	<5	<5	0.0	No Limit
ES1325013-002	Anonymous	EP074: Naphthalene	91-20-3	5	mg/kg	<5	<5	0.0	No Limit
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3167006)</b>									
ES1324716-001	MA_MW01_0.5	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
ES1325013-004	Anonymous	EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
		EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit		
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit		
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3167006)</b>									
ES1324716-001	MA_MW01_0.5	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3167006) - continued</b>									
ES1324716-001	MA_MW01_0.5	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1325013-004	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3166952)</b>									
ES1324716-001	MA_MW01_0.5	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1325013-002	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3167005)</b>									
ES1324716-001	MA_MW01_0.5	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1325013-004	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3166952)</b>									
ES1324716-001	MA_MW01_0.5	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES1325013-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3167005)</b>									





Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3167005) - continued</b>									
ES1324716-001	MA_MW01_0.5	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
ES1325013-004	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3166952)</b>									
ES1324716-001	MA_MW01_0.5	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1325013-002	Anonymous	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
		EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit		





## Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3167577)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	110	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	109	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	104	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	105	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	103	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	107	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	84.9	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	112	81	133	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3167578)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	84.9	66	112	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3166266)</b>									
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	85.3	57.4	117	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3166953)</b>									
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	96.2	64	126	
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	95.4	66	128	
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	92.6	63	129	
EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	91.5	63	129	
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	93.7	64	130	
EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	91.8	63	129	
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	91.9	63	129	
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	93.2	62	130	
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	95.9	61	131	
<b>EP074B: Oxygenated Compounds (QCLot: 3166953)</b>									
EP074: Vinyl Acetate	108-05-4	1	mg/kg	----	10 mg/kg	103	29.6	156	
		5	mg/kg	<5	----	----	----	----	
EP074: 2-Butanone (MEK)	78-93-3	1	mg/kg	----	10 mg/kg	104	58	136	
		5	mg/kg	<5	----	----	----	----	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	1	mg/kg	----	10 mg/kg	104	54	138	
		5	mg/kg	<5	----	----	----	----	
EP074: 2-Hexanone (MBK)	591-78-6	1	mg/kg	----	10 mg/kg	110	54	136	
		5	mg/kg	<5	----	----	----	----	
<b>EP074C: Sulfonated Compounds (QCLot: 3166953)</b>									
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	106	54	126	
<b>EP074D: Fumigants (QCLot: 3166953)</b>									



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074D: Fumigants (QCLot: 3166953) - continued</b>									
EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	84.3	55	133	
EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	97.0	69	127	
EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	94.3	54	124	
EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	96.0	51	125	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	96.2	66	126	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3166953)</b>									
EP074: Dichlorodifluoromethane	75-71-8	1	mg/kg	----	10 mg/kg	85.7	30	148	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloromethane	74-87-3	1	mg/kg	----	10 mg/kg	89.7	41	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Vinyl chloride	75-01-4	1	mg/kg	----	10 mg/kg	104	43	147	
		5	mg/kg	<5	----	----	----	----	
EP074: Bromomethane	74-83-9	1	mg/kg	----	10 mg/kg	91.9	47	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloroethane	75-00-3	1	mg/kg	----	10 mg/kg	97.3	49	143	
		5	mg/kg	<5	----	----	----	----	
EP074: Trichlorofluoromethane	75-69-4	1	mg/kg	----	10 mg/kg	101	49	135	
		5	mg/kg	<5	----	----	----	----	
EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	99.9	54	126	
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	94.0	43	129	
EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	98.6	62	130	
EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	96.8	66	132	
EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	97.7	66	132	
EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	84.1	62	126	
EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	95.6	64	128	
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	101	59	125	
EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	101	65	123	
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	100	64	120	
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	101	65	127	
EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	104	70	130	
EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	101	72	128	
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	97.9	67	143	
EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	92.0	62	122	
EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	85.1	54	128	
EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	110	55	129	
EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	103	56	132	
EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	110	65	135	
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	98.4	19.8	134	
EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	101	53	129	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3166953) - continued</b>									
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	95.5	48	136	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3166953)</b>									
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	99.6	70	128	
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	94.8	67	127	
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	95.4	64	130	
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	94.8	62	130	
EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	97.4	63	129	
EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	96.0	63	129	
EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	97.1	66	128	
EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	94.4	54	134	
EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	100	60	132	
<b>EP074G: Trihalomethanes (QCLot: 3166953)</b>									
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	99.3	62	120	
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	107	61	121	
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	107	63	121	
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	108	60	126	
<b>EP074H: Naphthalene (QCLot: 3166953)</b>									
EP074: Naphthalene	91-20-3	0.5	mg/kg	----	1 mg/kg	94.8	63	133	
		5	mg/kg	<5	----	----	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3167006)</b>									
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	101	74	116	
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	85.6	74	116	
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	104	72	116	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	104	69	123	
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	80.1	60.3	117	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	85.8	69	117	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	82.7	68	112	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	88.0	73	117	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	# 76.3	76.4	114	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	74.5	57	111	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	73.8	68.9	112	
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	30.7	3.9	57	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3167006)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	82.1	80	124	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	97.7	77	123	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	97.1	79	123	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	103	77	123	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	101	79	123	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3167006) - continued</b>									
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	101	79	123	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	106	79	123	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	97.1	79	125	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	95.6	73	121	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	102	81	123	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	94.8	70	118	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	97.5	77	123	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	91.2	76	122	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	94.2	71	113	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	92.9	71.7	113	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	94.7	72.4	114	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3166952)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	105	68.4	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3167005)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	102	71	131	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	102	74	138	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	87.4	64	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3166952)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	104	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3167005)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	103	70	130	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	96.4	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	
		50	mg/kg	----	150 mg/kg	73.0	63	131	
<b>EP080: BTEXN (QCLot: 3166952)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	102	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	103	62	128	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	102	58	118	
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	102	60	120	
	106-42-3								
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	106	60	120	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	94.2	62	138	

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL

Matrix Spike (MS) Report		
Spike	SpikeRecovery(%)	Recovery Limits (%)



Sub-Matrix: SOIL

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EG005T: Total Metals by ICP-AES (QCLot: 3167577)</b>							
ES1324716-001	MA_MW01_0.5	EG005T: Arsenic	7440-38-2	50 mg/kg	108	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	112	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	105	70	130
		EG005T: Copper	7440-50-8	125 mg/kg	104	70	130
		EG005T: Lead	7439-92-1	125 mg/kg	106	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	106	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	100	70	130
		EG005T: Zinc	7440-66-6	125 mg/kg	108	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3167578)</b>							
ES1324716-001	MA_MW01_0.5	EG035T: Mercury	7439-97-6	5 mg/kg	97.6	70	130
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3166266)</b>							
ES1324722-002	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	83.6	70	130
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3166953)</b>							
ES1324716-001	MA_MW01_0.5	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	94.0	70	130
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	89.0	70	130
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3166953)</b>							
ES1324716-001	MA_MW01_0.5	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	91.6	70	130
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3167006)</b>							
ES1324716-001	MA_MW01_0.5	EP075(SIM): Phenol	108-95-2	20 mg/kg	115	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	20 mg/kg	98.1	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	20 mg/kg	73.0	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	20 mg/kg	95.2	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	20 mg/kg	73.5	20	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3167006)</b>							
ES1324716-001	MA_MW01_0.5	EP075(SIM): Acenaphthene	83-32-9	20 mg/kg	89.3	70	130
		EP075(SIM): Pyrene	129-00-0	20 mg/kg	88.0	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3166952)</b>							
ES1324716-001	MA_MW01_0.5	EP080: C6 - C9 Fraction	----	32.5 mg/kg	97.2	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3167005)</b>							
ES1324716-001	MA_MW01_0.5	EP071: C10 - C14 Fraction	----	640 mg/kg	108	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	110	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	106	52	132
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3166952)</b>							
ES1324716-001	MA_MW01_0.5	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	94.5	70	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3167005)</b>							
ES1324716-001	MA_MW01_0.5	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	127	73	137



Sub-Matrix: SOIL				Matrix Spike (MS) Report				
				Spike Concentration	Spike Recovery(%) MS	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3167005) - continued</b>								
ES1324716-001	MA_MW01_0.5	EP071: >C16 - C34 Fraction	----	4800 mg/kg	105	53	131	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	82.9	52	132	
<b>EP080: BTEXN (QCLot: 3166952)</b>								
ES1324716-001	MA_MW01_0.5	EP080: Benzene	71-43-2	2.5 mg/kg	85.7	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	86.9	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	88.1	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	90.0	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	90.4	70	130	
	EP080: Naphthalene	91-20-3	2.5 mg/kg	78.8	70	130		

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report							
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3166266)</b>											
ES1324722-002	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	83.6	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3166952)</b>											
ES1324716-001	MA_MW01_0.5	EP080: C6 - C9 Fraction	----	32.5 mg/kg	97.2	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3166952)</b>											
ES1324716-001	MA_MW01_0.5	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	94.5	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3166952)</b>											
ES1324716-001	MA_MW01_0.5	EP080: Benzene	71-43-2	2.5 mg/kg	85.7	----	70	130	----	----	
		EP080: Toluene	108-88-3	2.5 mg/kg	86.9	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	88.1	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	90.0	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	90.4	----	70	130	----	----	
	EP080: Naphthalene	91-20-3	2.5 mg/kg	78.8	----	70	130	----	----		
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3166953)</b>											
ES1324716-001	MA_MW01_0.5	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	94.0	----	70	130	----	----	
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	89.0	----	70	130	----	----	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3166953)</b>											
ES1324716-001	MA_MW01_0.5	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	91.6	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3167005)</b>											



Sub-Matrix: SOIL

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3167005) - continued</b>										
ES1324716-001	MA_MW01_0.5	EP071: C10 - C14 Fraction	----	640 mg/kg	108	----	73	137	----	----
		EP071: C15 - C28 Fraction	----	3140 mg/kg	110	----	53	131	----	----
		EP071: C29 - C36 Fraction	----	2860 mg/kg	106	----	52	132	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3167005)</b>										
ES1324716-001	MA_MW01_0.5	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	127	----	73	137	----	----
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	105	----	53	131	----	----
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	82.9	----	52	132	----	----
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3167006)</b>										
ES1324716-001	MA_MW01_0.5	EP075(SIM): Phenol	108-95-2	20 mg/kg	115	----	70	130	----	----
		EP075(SIM): 2-Chlorophenol	95-57-8	20 mg/kg	98.1	----	70	130	----	----
		EP075(SIM): 2-Nitrophenol	88-75-5	20 mg/kg	73.0	----	60	130	----	----
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	20 mg/kg	95.2	----	70	130	----	----
		EP075(SIM): Pentachlorophenol	87-86-5	20 mg/kg	73.5	----	20	130	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3167006)</b>										
ES1324716-001	MA_MW01_0.5	EP075(SIM): Acenaphthene	83-32-9	20 mg/kg	89.3	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	20 mg/kg	88.0	----	70	130	----	----
<b>EG005T: Total Metals by ICP-AES (QCLot: 3167577)</b>										
ES1324716-001	MA_MW01_0.5	EG005T: Arsenic	7440-38-2	50 mg/kg	108	----	70	130	----	----
		EG005T: Cadmium	7440-43-9	50 mg/kg	112	----	70	130	----	----
		EG005T: Chromium	7440-47-3	50 mg/kg	105	----	70	130	----	----
		EG005T: Copper	7440-50-8	125 mg/kg	104	----	70	130	----	----
		EG005T: Lead	7439-92-1	125 mg/kg	106	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	106	----	70	130	----	----
		EG005T: Selenium	7782-49-2	50 mg/kg	100	----	70	130	----	----
		EG005T: Zinc	7440-66-6	125 mg/kg	108	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3167578)</b>										
ES1324716-001	MA_MW01_0.5	EG035T: Mercury	7439-97-6	5 mg/kg	97.6	----	70	130	----	----



## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1324716</b>	Page	: 1 of 10
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: SYMPHONY DELTAWEST	Contact	: Barbara Hanna
Address	: GRND FLOOR, 33 SAUNDERS STREET PYRMONT NSW AUSTRALIA 2009	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: symphony.deltawest@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
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Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: PROJECT SYMPHONY - MP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 14-NOV-2013
C-O-C number	: ----	Issue Date	: 26-NOV-2013
Sampler	: TS, GP	No. of samples received	: 19
Order number	: 0207423	No. of samples analysed	: 9
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers





## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EA055: Moisture Content</b>								
<b>Soil Glass Jar - Unpreserved (EA055-103)</b> MA_MW01_0.5, MA_MW03_0.5	MK_SB42_0.4,	11-NOV-2013	----	----	----	20-NOV-2013	25-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EA055-103)</b> MK_SB30_0.5, MK_SB71_0.5, MA_MW08_0.2	MK_SB24_0.4, MA_MW05_0.1, MA_MW08_0.5	12-NOV-2013	----	----	----	20-NOV-2013	26-NOV-2013	✓
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
<b>Snap Lock Bag (EA200)</b> MA_MW01_0.5, MA_MW03_0.5	MK_SB42_0.4,	11-NOV-2013	---	10-MAY-2014	----	26-NOV-2013	25-MAY-2014	✓
<b>Snap Lock Bag (EA200)</b> MK_SB30_0.5, MK_SB71_0.5, MA_MW08_0.2	MK_SB24_0.4, MA_MW05_0.1,	12-NOV-2013	---	11-MAY-2014	----	26-NOV-2013	25-MAY-2014	✓
<b>EG005T: Total Metals by ICP-AES</b>								
<b>Soil Glass Jar - Unpreserved (EG005T)</b> MA_MW01_0.5, MA_MW03_0.5	MK_SB42_0.4,	11-NOV-2013	20-NOV-2013	10-MAY-2014	✓	20-NOV-2013	10-MAY-2014	✓
<b>Soil Glass Jar - Unpreserved (EG005T)</b> MK_SB30_0.5, MK_SB71_0.5, MA_MW08_0.2	MK_SB24_0.4, MA_MW05_0.1, MA_MW08_0.5	12-NOV-2013	20-NOV-2013	11-MAY-2014	✓	20-NOV-2013	11-MAY-2014	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
<b>Soil Glass Jar - Unpreserved (EG035T)</b> MA_MW01_0.5, MA_MW03_0.5	MK_SB42_0.4,	11-NOV-2013	20-NOV-2013	09-DEC-2013	✓	21-NOV-2013	09-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EG035T)</b> MK_SB30_0.5, MK_SB71_0.5, MA_MW08_0.2	MK_SB24_0.4, MA_MW05_0.1, MA_MW08_0.5	12-NOV-2013	20-NOV-2013	10-DEC-2013	✓	21-NOV-2013	10-DEC-2013	✓



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Soil Glass Jar - Unpreserved (EP066) MA_MW01_0.5, MA_MW03_0.5	11-NOV-2013	19-NOV-2013	25-NOV-2013	✔	20-NOV-2013	29-DEC-2013	✔	
Soil Glass Jar - Unpreserved (EP066) MA_MW05_0.1, MA_MW08_0.5	12-NOV-2013	19-NOV-2013	26-NOV-2013	✔	20-NOV-2013	29-DEC-2013	✔	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
Soil Glass Jar - Unpreserved (EP071) MA_MW01_0.5, MA_MW03_0.5	11-NOV-2013	20-NOV-2013	25-NOV-2013	✔	21-NOV-2013	30-DEC-2013	✔	
Soil Glass Jar - Unpreserved (EP071) MK_SB30_0.5, MK_SB71_0.5, MA_MW08_0.2, MK_SB24_0.4, MA_MW05_0.1, MA_MW08_0.5	12-NOV-2013	20-NOV-2013	26-NOV-2013	✔	21-NOV-2013	30-DEC-2013	✔	
<b>EP074D: Fumigants</b>								
Soil Glass Jar - Unpreserved (EP074) MA_MW01_0.5, MA_MW03_0.5	11-NOV-2013	20-NOV-2013	18-NOV-2013	✖	21-NOV-2013	18-NOV-2013	✖	
Soil Glass Jar - Unpreserved (EP074) MA_MW05_0.1, MA_MW08_0.5	12-NOV-2013	20-NOV-2013	19-NOV-2013	✖	21-NOV-2013	19-NOV-2013	✖	
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Soil Glass Jar - Unpreserved (EP074) MA_MW01_0.5, MA_MW03_0.5	11-NOV-2013	20-NOV-2013	18-NOV-2013	✖	21-NOV-2013	18-NOV-2013	✖	
Soil Glass Jar - Unpreserved (EP074) MA_MW05_0.1, MA_MW08_0.5	12-NOV-2013	20-NOV-2013	19-NOV-2013	✖	21-NOV-2013	19-NOV-2013	✖	
<b>EP074F: Halogenated Aromatic Compounds</b>								
Soil Glass Jar - Unpreserved (EP074) MA_MW01_0.5, MA_MW03_0.5	11-NOV-2013	20-NOV-2013	18-NOV-2013	✖	21-NOV-2013	18-NOV-2013	✖	
Soil Glass Jar - Unpreserved (EP074) MA_MW05_0.1, MA_MW08_0.5	12-NOV-2013	20-NOV-2013	19-NOV-2013	✖	21-NOV-2013	19-NOV-2013	✖	
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Soil Glass Jar - Unpreserved (EP074) MA_MW01_0.5, MA_MW03_0.5	11-NOV-2013	20-NOV-2013	18-NOV-2013	✖	21-NOV-2013	18-NOV-2013	✖	
Soil Glass Jar - Unpreserved (EP074) MA_MW05_0.1, MA_MW08_0.5	12-NOV-2013	20-NOV-2013	19-NOV-2013	✖	21-NOV-2013	19-NOV-2013	✖	



Matrix: SOIL

Evaluation: ✘ = Holding time breach ; ✔ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP074H: Naphthalene</b>								
Soil Glass Jar - Unpreserved (EP074) MA_MW01_0.5,	MA_MW03_0.5	11-NOV-2013	20-NOV-2013	18-NOV-2013	✘	21-NOV-2013	18-NOV-2013	✘
Soil Glass Jar - Unpreserved (EP074) MA_MW05_0.1, MA_MW08_0.5	MA_MW08_0.2,	12-NOV-2013	20-NOV-2013	19-NOV-2013	✘	21-NOV-2013	19-NOV-2013	✘
<b>EP074B: Oxygenated Compounds</b>								
Soil Glass Jar - Unpreserved (EP074) MA_MW01_0.5,	MA_MW03_0.5	11-NOV-2013	20-NOV-2013	18-NOV-2013	✘	21-NOV-2013	18-NOV-2013	✘
Soil Glass Jar - Unpreserved (EP074) MA_MW05_0.1, MA_MW08_0.5	MA_MW08_0.2,	12-NOV-2013	20-NOV-2013	19-NOV-2013	✘	21-NOV-2013	19-NOV-2013	✘
<b>EP074C: Sulfonated Compounds</b>								
Soil Glass Jar - Unpreserved (EP074) MA_MW01_0.5,	MA_MW03_0.5	11-NOV-2013	20-NOV-2013	18-NOV-2013	✘	21-NOV-2013	18-NOV-2013	✘
Soil Glass Jar - Unpreserved (EP074) MA_MW05_0.1, MA_MW08_0.5	MA_MW08_0.2,	12-NOV-2013	20-NOV-2013	19-NOV-2013	✘	21-NOV-2013	19-NOV-2013	✘
<b>EP074G: Trihalomethanes</b>								
Soil Glass Jar - Unpreserved (EP074) MA_MW01_0.5,	MA_MW03_0.5	11-NOV-2013	20-NOV-2013	18-NOV-2013	✘	21-NOV-2013	18-NOV-2013	✘
Soil Glass Jar - Unpreserved (EP074) MA_MW05_0.1, MA_MW08_0.5	MA_MW08_0.2,	12-NOV-2013	20-NOV-2013	19-NOV-2013	✘	21-NOV-2013	19-NOV-2013	✘
<b>EP075(SIM)A: Phenolic Compounds</b>								
Soil Glass Jar - Unpreserved (EP075(SIM)) MA_MW01_0.5, MA_MW03_0.5	MK_SB42_0.4,	11-NOV-2013	20-NOV-2013	25-NOV-2013	✔	21-NOV-2013	30-DEC-2013	✔
Soil Glass Jar - Unpreserved (EP075(SIM)) MK_SB30_0.5, MK_SB71_0.5, MA_MW08_0.2,	MK_SB24_0.4, MA_MW05_0.1, MA_MW08_0.2,	12-NOV-2013	20-NOV-2013	26-NOV-2013	✔	21-NOV-2013	30-DEC-2013	✔
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Soil Glass Jar - Unpreserved (EP075(SIM)) MA_MW01_0.5, MA_MW03_0.5	MK_SB42_0.4,	11-NOV-2013	20-NOV-2013	25-NOV-2013	✔	21-NOV-2013	30-DEC-2013	✔
Soil Glass Jar - Unpreserved (EP075(SIM)) MK_SB30_0.5, MK_SB71_0.5, MA_MW08_0.2,	MK_SB24_0.4, MA_MW05_0.1, MA_MW08_0.2,	12-NOV-2013	20-NOV-2013	26-NOV-2013	✔	21-NOV-2013	30-DEC-2013	✔



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP080: BTEXN</b>							
<b>Soil Glass Jar - Unpreserved (EP080)</b> MA_MW01_0.5, MK_SB42_0.4, MA_MW03_0.5	11-NOV-2013	20-NOV-2013	25-NOV-2013	✓	21-NOV-2013	25-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB30_0.5, MK_SB24_0.4, MK_SB71_0.5, MA_MW05_0.1, MA_MW08_0.2, MA_MW08_0.2	12-NOV-2013	20-NOV-2013	26-NOV-2013	✓	21-NOV-2013	26-NOV-2013	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>							
<b>Soil Glass Jar - Unpreserved (EP080)</b> MA_MW01_0.5, MK_SB42_0.4, MA_MW03_0.5	11-NOV-2013	20-NOV-2013	25-NOV-2013	✓	21-NOV-2013	25-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MK_SB30_0.5, MK_SB24_0.4, MK_SB71_0.5, MA_MW05_0.1, MA_MW08_0.2, MA_MW08_0.2	12-NOV-2013	20-NOV-2013	26-NOV-2013	✓	21-NOV-2013	26-NOV-2013	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Moisture Content	EA055-103	4	37	10.8	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	11	18.2	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Asbestos Identification in bulk solids	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
TPH - Semivolatle Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (2013) Schedule B(3) (Method 506.1)
Volatile Organic Compounds	EP074	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option A - Concentrating)	ORG17A	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

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Work Order : ES1324716  
Client : ENVIRO RESOURCES MANAGEMENT  
Project : PROJECT SYMPHONY - MP



<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.



## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Laboratory Control Spike (LCS) Recoveries</b>							
EP075(SIM)A: Phenolic Compounds	3779351-007	----	<b>4-Chloro-3-methylphenol</b>	59-50-7	76.3 %	76.4-114%	<b>Recovery less than lower control limit</b>

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Matrix Spike outliers occur.

#### Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

Matrix: **SOIL**

Method Container / Client Sample ID(s)	Extraction / Preparation			Analysis			
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue	
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>							
<b>Soil Glass Jar - Unpreserved</b> MA_MW01_0.5,	MA_MW03_0.5	20-NOV-2013	18-NOV-2013	2	21-NOV-2013	18-NOV-2013	3
<b>Soil Glass Jar - Unpreserved</b> MA_MW05_0.1, MA_MW08_0.5	MA_MW08_0.2,	20-NOV-2013	19-NOV-2013	1	21-NOV-2013	19-NOV-2013	2
<b>EP074B: Oxygenated Compounds</b>							
<b>Soil Glass Jar - Unpreserved</b> MA_MW01_0.5,	MA_MW03_0.5	20-NOV-2013	18-NOV-2013	2	21-NOV-2013	18-NOV-2013	3
<b>Soil Glass Jar - Unpreserved</b> MA_MW05_0.1, MA_MW08_0.5	MA_MW08_0.2,	20-NOV-2013	19-NOV-2013	1	21-NOV-2013	19-NOV-2013	2
<b>EP074C: Sulfonated Compounds</b>							
<b>Soil Glass Jar - Unpreserved</b> MA_MW01_0.5,	MA_MW03_0.5	20-NOV-2013	18-NOV-2013	2	21-NOV-2013	18-NOV-2013	3
<b>Soil Glass Jar - Unpreserved</b> MA_MW05_0.1, MA_MW08_0.5	MA_MW08_0.2,	20-NOV-2013	19-NOV-2013	1	21-NOV-2013	19-NOV-2013	2





Matrix: **SOIL**

Method Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
<b>EP074D: Fumigants</b>						
Soil Glass Jar - Unpreserved MA_MW01_0.5, MA_MW03_0.5	20-NOV-2013	18-NOV-2013	2	21-NOV-2013	18-NOV-2013	3
Soil Glass Jar - Unpreserved MA_MW05_0.1, MA_MW08_0.5	20-NOV-2013	19-NOV-2013	1	21-NOV-2013	19-NOV-2013	2
<b>EP074E: Halogenated Aliphatic Compounds</b>						
Soil Glass Jar - Unpreserved MA_MW01_0.5, MA_MW03_0.5	20-NOV-2013	18-NOV-2013	2	21-NOV-2013	18-NOV-2013	3
Soil Glass Jar - Unpreserved MA_MW05_0.1, MA_MW08_0.5	20-NOV-2013	19-NOV-2013	1	21-NOV-2013	19-NOV-2013	2
<b>EP074F: Halogenated Aromatic Compounds</b>						
Soil Glass Jar - Unpreserved MA_MW01_0.5, MA_MW03_0.5	20-NOV-2013	18-NOV-2013	2	21-NOV-2013	18-NOV-2013	3
Soil Glass Jar - Unpreserved MA_MW05_0.1, MA_MW08_0.5	20-NOV-2013	19-NOV-2013	1	21-NOV-2013	19-NOV-2013	2
<b>EP074G: Trihalomethanes</b>						
Soil Glass Jar - Unpreserved MA_MW01_0.5, MA_MW03_0.5	20-NOV-2013	18-NOV-2013	2	21-NOV-2013	18-NOV-2013	3
Soil Glass Jar - Unpreserved MA_MW05_0.1, MA_MW08_0.5	20-NOV-2013	19-NOV-2013	1	21-NOV-2013	19-NOV-2013	2
<b>EP074H: Naphthalene</b>						
Soil Glass Jar - Unpreserved MA_MW01_0.5, MA_MW03_0.5	20-NOV-2013	18-NOV-2013	2	21-NOV-2013	18-NOV-2013	3
Soil Glass Jar - Unpreserved MA_MW05_0.1, MA_MW08_0.5	20-NOV-2013	19-NOV-2013	1	21-NOV-2013	19-NOV-2013	2

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

**Work Order : ES1324716**

<p><b>Client : ENVIRO RESOURCES MANAGEMENT</b></p> <p><b>Contact : SYMPHONY DELTAWEST</b>  <b>Address : GRND FLOOR, 33 SAUNDERS STREET</b>  <b>PYRMONT NSW AUSTRALIA 2009</b></p> <p><b>E-mail : symphony.deltawest@erm.com</b>  <b>Telephone : +61 02 8584 8888</b>  <b>Facsimile : +61 02 8584 8800</b></p> <p><b>Project : PROJECT SYMPHONY - MP</b>  <b>Order number : 0207423</b>  <b>C-O-C number : ----</b>  <b>Site : ----</b>  <b>Sampler : TS, GP</b></p>	<p><b>Laboratory : Environmental Division Sydney</b></p> <p><b>Contact : Barbara Hanna</b>  <b>Address : 277-289 Woodpark Road Smithfield</b>  <b>NSW Australia 2164</b></p> <p><b>E-mail : Barbara.Hanna@alsglobal.com</b>  <b>Telephone : +61 2 8784 8555</b>  <b>Facsimile : +61 2 8784 8555</b></p> <p><b>Page : 1 of 2</b></p> <p><b>Quote number : ES2013ENVRES0370 (SY/278/13 V3)</b></p> <p><b>QC Level : NEPM 2013 Schedule B(3) and ALS QCS3 requirement</b></p>
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#### Dates

<p><b>Date Samples Received : 14-NOV-2013</b></p> <p><b>Client Requested Due Date : 22-NOV-2013</b></p>	<p><b>Issue Date : 15-NOV-2013 19:43</b></p> <p><b>Scheduled Reporting Date : <b>22-NOV-2013</b></b></p>
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#### Delivery Details

<p><b>Mode of Delivery : Carrier</b></p> <p><b>No. of coolers/boxes : 1 HARD</b></p> <p><b>Security Seal : Intact.</b></p>	<p><b>Temperature : 3.1°C - Ice present</b></p> <p><b>No. of samples received : 19</b></p> <p><b>No. of samples analysed : 9</b></p>
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#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA200 Asbestos Identification in Soils	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP066 (solids) Polychlorinated Biphenyls by GCMS	SOIL - EP074 (solids) Volatile Organic Compounds	SOIL - S-27 TRH/B/TEXNI/PAH/Phenols/6Metals
ES1324716-001	11-NOV-2013 13:50	MA_MW01_0.5		✓	✓	✓	✓	✓
ES1324716-002	11-NOV-2013 16:55	MK_SB42_0.4		✓	✓			✓
ES1324716-003	11-NOV-2013 15:35	MA_MW03_0.5		✓	✓	✓	✓	✓
ES1324716-004	12-NOV-2013 10:20	MK_SB30_0.5		✓	✓			✓
ES1324716-005	12-NOV-2013 11:25	MK_SB24_0.4		✓	✓			✓
ES1324716-006	12-NOV-2013 13:55	MK_SB71_0.5		✓	✓			✓
ES1324716-007	12-NOV-2013 15:10	MA_MW05_0.1		✓	✓	✓	✓	✓
ES1324716-008	12-NOV-2013 15:50	MA_MW08_0.2		✓	✓	✓	✓	✓
ES1324716-009	12-NOV-2013 16:00	MA_MW08_0.5			✓	✓	✓	✓
ES1324716-010	11-NOV-2013 13:40	MA_MW01_0.2	✓					
ES1324716-011	11-NOV-2013 14:00	MA_MW01_1.0	✓					
ES1324716-012	11-NOV-2013 15:30	MA_MW03_0.2	✓					
ES1324716-013	11-NOV-2013 15:43	MA_MW03_0.85	✓					
ES1324716-014	12-NOV-2013 09:45	MK_SB30_0.2	✓					
ES1324716-015	12-NOV-2013 10:25	MK_SB30_0.8	✓					
ES1324716-016	12-NOV-2013 11:20	MK_SB24_0.25	✓					
ES1324716-017	12-NOV-2013 11:40	MK_SB24_0.8	✓					
ES1324716-018	12-NOV-2013 13:45	MK_SB71_0.1	✓					
ES1324716-019	12-NOV-2013 14:10	MK_SB71_1.0	✓					

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

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Email symphony.deltawest@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

DADELADE 21 Burnie Road Burnie SA 5005  
Ph: 08 9360 9800 E: dadedla@alsglobal.com

DELSBORNE 32 Stuart Street Stirling QLD 4053  
Ph: 07 3243 7222 E: samples.del@alsglobal.com

DEGLADSTONE 40 Calumet Drive Chirn QLD 4660  
Ph: 07 7471 5800 E: gladstone@alsglobal.com

DMACKAY 78 Harbour Road Mackay QLD 4740  
Ph: 07 4944 0177 E: mackay@alsglobal.com

DMELBOURNE 24 Westall Road Springvale VIC 3171  
Ph: 03 8549 9000 E: samples.mel@alsglobal.com

DMULGOON 27 Sydney Road Mulgoon NSW 2950  
Ph: 02 6372 6726 E: mulgoon@alsglobal.com

DMUNCASTLE 5 Ross Gum Road Waratah NSW 2304  
Ph: 02 4968 8432 E: samples.mun@alsglobal.com

DMOWRA 413 Garry Plaza North Nowra NSW 2541  
Ph: 02423 2065 E: nowra@alsglobal.com

DMPERTH 10 Hood Way Melaleuca WA 6000  
Ph: 08 9208 7655 E: samples.per@alsglobal.com

DMSTONEY 227-230 Woodcock Road Southfield NSW 2154  
Ph: 02 8184 8553 E: samples.sto@alsglobal.com

DMTOWNSVILLE 14-16 Deering Court Beale QLD 4818  
Ph: 07 4782 2222 E: samples.town@alsglobal.com

**CLIENT:** ENM

**OFFICE:** Sydney

**PROJECT:** Project Symphony - MP

**ORDER NUMBER:** 0207423

**PROJECT MANAGER:** Jonathan Lekawski

**SAMPLER:** Thavone Shaw/ Gavin Powell

**COC emailed to ALS?** ( YES  NO  )

**EDD FORMAT (or default):** pdf/cvs/asdat

**Email Reports to (will default to PM if no other addresses are listed):** Symphony.DeltaWes@em.com

**Email invoice to (will default to PM if no other addresses are listed):** Symphony.DeltaWes@em.com

**COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:**

**TURNAROUND REQUIREMENTS:**  
(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)  Non Standard or urgent TAT (List due date):

**ALS QUOTE NO.:** SW127813

**CONTACT PH.:**

**SAMPLER MOBILE:** 0255 960 035

**RELINQUISHED BY:** Thavone Shaw

**DATE/TIME:** 13-11-13 / 06:00

**RECEIVED BY:** David

**DATE/TIME:** 14/11 0830

**RELINQUISHED BY:**

**DATE/TIME:**

**RECEIVED BY:**

**DATE/TIME:**

**RELINQUISHED BY:**

**DATE/TIME:**

**Telephone:** + 61-2-8784 8555

COC SEQUENCE NUMBER (Circle)	FOR LABORATORY USE ONLY						
	Checked/Sealed?	Free of Contamination?	Random Sample?	Other Comments?	Checked/Sealed?	Free of Contamination?	Random Sample?
1							
2							
3							
4							
5							
6							
7							

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below)	TOTAL CONTAINERS	ANALYSIS REQUIRED INCLUDING SUITES (NB: Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).										Additional Information
						S-27 (8 metals - As, Cd, Cr, Cu, Ni, Pb, Zn, Hg, TRH/BTEX, PAH/Phenols)	Additional Metal - Se	TRH / BTEX / PAH / Phenol	Asbestos	VOC Scan	PCB	Particle Sizing (hydrometer), TOC -	pH, Exchangeable Cations plus ECEC			
10	MA-MW01-0.2	11-11-13/13:46	Soil	1 jar, 1 bag Ace	2	X	X	X	X	X	X					HOLD
11	MA-MW01-0.5	13:50	"	1 jar	1	X	X	X	X	X	X					HOLD
12	MA-MW03-0.2	15:30	"	1 jar, 1 bag	2	X	X	X	X	X	X					HOLD
2	ML-SB42-0.4	16:55	"	1 jar, 1 bag	2	X	X	X	X	X	X					HOLD
3	MA-MW03-0.15	15:35	"	1 jar, 1 bag	2	X	X	X	X	X	X					HOLD
13	MA-MW03-0.8S	15:43	"	1 jar	1	X	X	X	X	X	X					HOLD
14	ML-SB30-0.2	12-11-13 09:45	"	1 jar, 1 bag	2	X	X	X	X	X	X					HOLD
4	ML-SB30-0.5	10:20	"	1 jar	2	X	X	X	X	X	X					HOLD
15	ML-SB30-0.8	10:25	"	1 jar	1	X	X	X	X	X	X					HOLD
16	ML-SB30-0.25	11:20	"	1 jar, 1 bag	2	X	X	X	X	X	X					HOLD
5	ML-SB24-0.4	11:25	"	1 jar	2	X	X	X	X	X	X					HOLD
<b>TOTAL</b>																

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide Preserved Plastic; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved Plastic; AP = Airfreight Unpreserved Plastic

V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottles; SP = Sulfuric Preserved Glass;

Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; SS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag;

**Environmental Division**  
Sydney  
Work Order  
**ES1324716**



# CHAIN OF CUSTODY

ALS Laboratory  
please tick ->

When used for project work, the Chain of Custody form must be completed by the person who is responsible for the sample collection and delivery to the laboratory. It is the responsibility of the client to ensure that the sample is collected and delivered in accordance with the requirements of the Chain of Custody form. The Chain of Custody form must be completed for all samples collected for analysis by the laboratory.

When used for project work, the Chain of Custody form must be completed by the person who is responsible for the sample collection and delivery to the laboratory. It is the responsibility of the client to ensure that the sample is collected and delivered in accordance with the requirements of the Chain of Custody form. The Chain of Custody form must be completed for all samples collected for analysis by the laboratory.

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When used for project work, the Chain of Custody form must be completed by the person who is responsible for the sample collection and delivery to the laboratory. It is the responsibility of the client to ensure that the sample is collected and delivered in accordance with the requirements of the Chain of Custody form. The Chain of Custody form must be completed for all samples collected for analysis by the laboratory.

CLIENT: ERM

OFFICE: Sydney

PROJECT: Project Symphony - MP

ORDER NUMBER: 0207423

PROJECT MANAGER: Jonathan Lekawski

SAMPLER: Thavoie Spaw Gavin Powell

COC emailed to ALS? (YES / NO) NO

Email Reports to (will default to PM if no other addresses are listed): Symphony.DeltaWest@aem.com

Email Invoice to (will default to PM if no other addresses are listed): Symphony.DeltaWest@aem.com

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

TURNAROUND REQUIREMENTS:

(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)

ALS QUOTE NO.: SY1728/13

CONTACT PH: 0259000055

SAMPLER MOBILE: 0259000055

EDD FORMAT (or default): pdfdocswat

RELINQUISHED BY: Thavoie Spaw

DATE/TIME: 13-11-13/06:00

RECEIVED BY: David

DATE/TIME: 14/11/13

Standard TAT (last due date):

Non Standard or urgent TAT (last due date):

COC SEQUENCE NUMBER (Circle)

1 2 3 4 5 6 7

RECEIVED BY: David

DATE/TIME: 14/11/13

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free Ice / frozen Ice blocks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: 10 °C

Other comment:

RECEIVED BY: David

DATE/TIME: 14/11/13

ALS USE	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (codes below)	TOTAL CONTAINERS	ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to extract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).	Additional Metal - Se	TRH / BTEX / PAH / Phenol	Asbestos	VOC Scan	PCB	Particle Sizing (hydrometer), TOC	pH, Exchangeable Cations plus ECEC	Additional Information
---------	-----------	-------------	--------	-----------------------------------	------------------	---	-----------------------	---------------------------	----------	----------	-----	-----------------------------------	------------------------------------	------------------------

	ML-SB24-0.8	12-11-13/11:40	Soil	Jar	1									HOLD
	ML-SB71-0.1	13-11-13	Jar	1 bag 1 jar	2									HOLD
	ML-SB71-0.5	13-11-13	Jar	"	2									
	ML-SB71-1.0	14-11-13	Jar	Jar	1									HOLD
	MA-MWDS-0.1	15-11-13	Jar	1 bag, Jar	2									
	MA-MWDS-0.2	15-11-13	Jar	Jar	2									
	MA-MWDS-0.5	16-11-13	Jar	Jar	2									

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORG = Nitric Preserved ORG; SH = Sodium Hydroxide Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airtight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulfate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airtight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulfate soils; B = Unpreserved Bag.

## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>ES1324879</b> <b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : MR JONATHAN LEKAWSKI <b>Address</b> : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007  <b>E-mail</b> : jonathan.lekawski@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800 <b>Project</b> : PROJECT SYMPHONY - MP <b>Order number</b> : 0207423 <b>C-O-C number</b> : ---- <b>Sampler</b> : TS <b>Site</b> : ----  <b>Quote number</b> : SY/278/13 V3	<b>Page</b> : 1 of 7  <b>Laboratory</b> : Environmental Division Sydney <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164  <b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555 <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement  <b>Date Samples Received</b> : 15-NOV-2013 <b>Issue Date</b> : 25-NOV-2013  <b>No. of samples received</b> : 10 <b>No. of samples analysed</b> : 6
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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits



NATA Accredited Laboratory 825  
 Accredited for compliance with  
 ISO/IEC 17025.

### *Signatories*

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Edwandy Fadjar	Organic Coordinator	Sydney Organics
Peter Rennie	Asbestos Identifier	Newcastle - Asbestos



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EA200 Legend**
- **EA200 'Am' Amosite (brown asbestos)**
- **EA200 'Ch' Chrysotile (white asbestos)**
- **EA200 'Cr' Crocidolite (blue asbestos)**
- **EA200 'Trace' - Asbestos fibres detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres**
- **EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.**
- **EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.**
- **EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.**
- **EP080: The TRIP SPIKE and TRIP SPIKE CONTROL have been analysed for volatile TPH and BTEX only. The TRIP SPIKE and TRIP SPIKE CONTROL were prepared in the lab using reagent grade sand spiked with petrol. The TRIP SPIKE was dispatched from the lab and the TRIP SPIKE CONTROL retained. The spike samples were extracted and analysed concurrently with samples reported in this batch.**



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ME-MW01-0.5	ME-MW04-0.5	ME-MW03-0.5	TS	TB
				14-NOV-2013 15:00	14-NOV-2013 10:45	14-NOV-2013 15:00	13-NOV-2013 15:00	13-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324879-002	ES1324879-004	ES1324879-006	ES1324879-008	ES1324879-009
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	16.8	13.2	11.6	----	----
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	----	----
Asbestos Type	1332-21-4	0.1	--	-	-	-	----	----
Sample weight (dry)	----	0.01	g	190	208	160	----	----
APPROVED IDENTIFIER:	----	-	--	P.RENNIE	P.RENNIE	P.RENNIE	----	----
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	----	----
Arsenic	7440-38-2	5	mg/kg	15	10	6	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	----	----
Chromium	7440-47-3	2	mg/kg	23	8	6	----	----
Copper	7440-50-8	5	mg/kg	30	20	8	----	----
Lead	7439-92-1	5	mg/kg	29	18	11	----	----
Nickel	7440-02-0	2	mg/kg	40	44	20	----	----
Zinc	7440-66-6	5	mg/kg	58	89	36	----	----
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	----	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	0.5	<0.5	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ME-MW01-0.5	ME-MW04-0.5	ME-MW03-0.5	TS	TB
				14-NOV-2013 15:00	14-NOV-2013 10:45	14-NOV-2013 15:00	13-NOV-2013 15:00	13-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324879-002	ES1324879-004	ES1324879-006	ES1324879-008	ES1324879-009
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	2.1	<0.5	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	1.6	<0.5	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	1.2	<0.5	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	0.6	<0.5	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	0.8	<0.5	----	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	0.6	<0.5	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	7.4	<0.5	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.7	0.6	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	1.2	----	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	96	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	110	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	71	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ME-MW01-0.5	ME-MW04-0.5	ME-MW03-0.5	TS	TB
				14-NOV-2013 15:00	14-NOV-2013 10:45	14-NOV-2013 15:00	13-NOV-2013 15:00	13-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324879-002	ES1324879-004	ES1324879-006	ES1324879-008	ES1324879-009
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	0.8	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	19.4	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	2.6	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	11.1	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	4.8	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	38.7	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	15.9	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	91.9	96.9	101	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	102	105	110	----	----
2,4,6-Tribromophenol	118-79-6	0.1	%	101	104	108	----	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	104	111	112	----	----
Anthracene-d10	1719-06-8	0.1	%	90.6	91.5	99.4	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	91.8	95.1	99.4	----	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	107	103	113	110	108
Toluene-D8	2037-26-5	0.1	%	109	104	114	115	116
4-Bromofluorobenzene	460-00-4	0.1	%	103	94.1	104	110	106



## Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)

Client sample ID

Client sampling date / time

				<b>TSC</b>	----	----	----	----
				13-NOV-2013 15:00	----	----	----	----
<i>Compound</i>	<i>CAS Number</i>	<i>LOR</i>	<i>Unit</i>	<b>ES1324879-010</b>	----	----	----	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
<b>C6 - C9 Fraction</b>	----	10	mg/kg	<b>102</b>	----	----	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
<b>C6 - C10 Fraction</b>	C6_C10	10	mg/kg	<b>118</b>	----	----	----	----
<b>C6 - C10 Fraction minus BTEX (F1)</b>	C6_C10-BTEX	10	mg/kg	<b>77</b>	----	----	----	----
<b>EP080: BTEXN</b>								
<b>Benzene</b>	71-43-2	0.2	mg/kg	<b>0.9</b>	----	----	----	----
<b>Toluene</b>	108-88-3	0.5	mg/kg	<b>20.4</b>	----	----	----	----
<b>Ethylbenzene</b>	100-41-4	0.5	mg/kg	<b>2.7</b>	----	----	----	----
<b>meta- &amp; para-Xylene</b>	108-38-3 106-42-3	0.5	mg/kg	<b>12.2</b>	----	----	----	----
<b>ortho-Xylene</b>	95-47-6	0.5	mg/kg	<b>5.0</b>	----	----	----	----
<b>Sum of BTEX</b>	----	0.2	mg/kg	<b>41.2</b>	----	----	----	----
<b>Total Xylenes</b>	1330-20-7	0.5	mg/kg	<b>17.2</b>	----	----	----	----
<b>Naphthalene</b>	91-20-3	1	mg/kg	<b>&lt;1</b>	----	----	----	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
<b>1,2-Dichloroethane-D4</b>	17060-07-0	0.1	%	<b>103</b>	----	----	----	----
<b>Toluene-D8</b>	2037-26-5	0.1	%	<b>113</b>	----	----	----	----
<b>4-Bromofluorobenzene</b>	460-00-4	0.1	%	<b>107</b>	----	----	----	----

## Analytical Results

### Descriptive Results

Sub-Matrix: **SOIL**

<i>Method: Compound</i>	<i>Client sample ID - Client sampling date / time</i>	<i>Analytical Results</i>
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>		
EA200: Description	ME-MW01-0.5 - 14-NOV-2013 15:00	Brown soil with small coal pieces
EA200: Description	ME-MW04-0.5 - 14-NOV-2013 10:45	Grey-brown soil with small to medium sized coal pieces
EA200: Description	ME-MW03-0.5 - 14-NOV-2013 15:00	Brown soil with small to medium sized coal pieces



## Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

## QUALITY CONTROL REPORT

<b>Work Order</b>	: <b>ES1324879</b>	Page	: 1 of 11
<b>Client</b>	: <b>ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: MR JONATHAN LEKAWSKI	<b>Contact</b>	: Barbara Hanna
<b>Address</b>	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: jonathan.lekawski@erm.com	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: PROJECT SYMPHONY - MP	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b>	: ----	<b>Date Samples Received</b>	: 15-NOV-2013
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: 25-NOV-2013
<b>Sampler</b>	: TS	<b>No. of samples received</b>	: 10
<b>Order number</b>	: 0207423	<b>No. of samples analysed</b>	: 6
<b>Quote number</b>	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

#### Signatories

Celine Conceicao  
Edwandy Fadjar  
Peter Rennie

#### Position

Senior Spectroscopist  
Organic Coordinator  
Asbestos Identifier

#### Accreditation Category

Sydney Inorganics  
Sydney Organics  
Newcastle - Asbestos



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## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :

- Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
- CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
- LOR = Limit of reporting
- RPD = Relative Percentage Difference
- # = Indicates failed QC



## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report							
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)		
<b>EA055: Moisture Content (QC Lot: 3167936)</b>											
ES1324841-008	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	18.0	17.1	5.0	0% - 50%		
ES1324882-007	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	6.7	7.4	9.4	No Limit		
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3167950)</b>											
ES1324726-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit		
		EG005T: Chromium	7440-47-3	2	mg/kg	26	28	8.8	0% - 50%		
		EG005T: Nickel	7440-02-0	2	mg/kg	28	28	0.0	0% - 50%		
		EG005T: Arsenic	7440-38-2	5	mg/kg	10	10	0.0	No Limit		
		EG005T: Copper	7440-50-8	5	mg/kg	23	23	0.0	No Limit		
		EG005T: Lead	7439-92-1	5	mg/kg	16	17	6.2	No Limit		
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit		
		EG005T: Zinc	7440-66-6	5	mg/kg	61	60	1.9	0% - 50%		
ES1324726-015	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit		
		EG005T: Chromium	7440-47-3	2	mg/kg	14	13	0.0	No Limit		
		EG005T: Nickel	7440-02-0	2	mg/kg	16	15	6.8	No Limit		
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit		
		EG005T: Copper	7440-50-8	5	mg/kg	9	8	0.0	No Limit		
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.0	No Limit		
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit		
		EG005T: Zinc	7440-66-6	5	mg/kg	25	25	0.0	No Limit		
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3167951)</b>											
ES1324726-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit		
ES1324726-015	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit		
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3166268)</b>											
ES1324729-001	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit		
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit		
		ES1324729-011	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3166268) - continued</b>									
ES1324729-011	Anonymous	EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit		
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3166268)</b>									
ES1324729-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
ES1324729-011	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit





Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3166268) - continued</b>										
ES1324729-011	Anonymous	EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3166267)</b>										
ES1324729-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit	
ES1324729-011	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3166889)</b>										
ES1324879-002	ME-MW01-0.5	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit	
ES1324919-005	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3166267)</b>										
ES1324729-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit	
ES1324729-011	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3166889)</b>										
ES1324879-002	ME-MW01-0.5	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit	
ES1324919-005	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit	
<b>EP080: BTEXN (QC Lot: 3166889)</b>										
ES1324879-002	ME-MW01-0.5	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
ES1324919-005	Anonymous	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit	
		EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	

Page : 6 of 11  
 Work Order : ES1324879  
 Client : ENVIRO RESOURCES MANAGEMENT  
 Project : PROJECT SYMPHONY - MP



Sub-Matrix: <b>SOIL</b>				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP080: BTEXN (QC Lot: 3166889) - continued</b>									
ES1324919-005	Anonymous	EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit



### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3167950)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	104	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	100	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	113	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	102	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	98.9	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	111	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	106	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	98.9	81	133	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3167951)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	87.4	66	112	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3166268)</b>									
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	102	74	116	
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	102	74	116	
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	107	72	116	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	112	69	123	
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	86.5	60.3	117	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	103	69	117	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	99.7	68	112	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	104	73	117	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	99.0	76.4	114	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	97.9	57	111	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	98.2	68.9	112	
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	36.0	3.9	57	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3166268)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	105	80	124	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	112	77	123	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	110	79	123	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	113	77	123	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	107	79	123	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	106	79	123	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	107	79	123	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	108	79	125	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	105	73	121	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	109	81	123	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3166268) - continued</b>									
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	102	70	118	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	109	77	123	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	104	76	122	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	94.3	71	113	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	92.8	71.7	113	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	94.3	72.4	114	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3166267)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	97.7	71	131	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	98.0	74	138	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	83.9	64	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3166889)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	102	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3166267)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	98.5	70	130	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	93.0	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	
		50	mg/kg	----	150 mg/kg	67.3	63	131	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3166889)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	101	68.4	128	
<b>EP080: BTEXN (QCLot: 3166889)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	87.5	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	94.6	62	128	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	87.8	58	118	
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	87.8	60	120	
	106-42-3								
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	87.2	60	120	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	76.4	62	138	

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report				
				Spike Concentration	Spike Recovery(%)		Recovery Limits (%)	
					MS	Low	High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3167950)</b>								
ES1324726-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	93.5	70	130	
		EG005T: Cadmium	7440-43-9	50 mg/kg	96.7	70	130	



Sub-Matrix: SOIL

				Matrix Spike (MS) Report				
				Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3167950) - continued</b>								
ES1324726-001	Anonymous	EG005T: Chromium	7440-47-3	50 mg/kg	104	70	130	
		EG005T: Copper	7440-50-8	125 mg/kg	99.3	70	130	
		EG005T: Lead	7439-92-1	125 mg/kg	95.6	70	130	
		EG005T: Nickel	7440-02-0	50 mg/kg	99.5	70	130	
		EG005T: Selenium	7782-49-2	50 mg/kg	93.2	70	130	
		EG005T: Zinc	7440-66-6	125 mg/kg	89.1	70	130	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3167951)</b>								
ES1324726-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	98.0	70	130	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3166268)</b>								
ES1324729-001	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	98.2	70	130	
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	99.7	70	130	
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	98.4	60	130	
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	98.3	70	130	
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	108	20	130	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3166268)</b>								
ES1324729-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	105	70	130	
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	113	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3166267)</b>								
ES1324729-001	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	81.6	73	137	
		EP071: C15 - C28 Fraction	----	3140 mg/kg	82.3	53	131	
		EP071: C29 - C36 Fraction	----	2860 mg/kg	72.0	52	132	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3166889)</b>								
ES1324879-002	ME-MW01-0.5	EP080: C6 - C9 Fraction	----	32.5 mg/kg	101	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3166267)</b>								
ES1324729-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	104	73	137	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	75.6	53	131	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	55.7	52	132	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3166889)</b>								
ES1324879-002	ME-MW01-0.5	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	101	70	130	
<b>EP080: BTEXN (QCLot: 3166889)</b>								
ES1324879-002	ME-MW01-0.5	EP080: Benzene	71-43-2	2.5 mg/kg	80.6	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	92.2	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	88.7	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	86.6	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	88.3	70	130	
EP080: Naphthalene	91-20-3	2.5 mg/kg	88.0	70	130			



### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
				Concentration	MS	MSD	Low	High	Value	Control Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3166267)</b>										
ES1324729-001	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	81.6	----	73	137	----	----
		EP071: C15 - C28 Fraction	----	3140 mg/kg	82.3	----	53	131	----	----
		EP071: C29 - C36 Fraction	----	2860 mg/kg	72.0	----	52	132	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3166267)</b>										
ES1324729-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	104	----	73	137	----	----
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	75.6	----	53	131	----	----
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	55.7	----	52	132	----	----
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3166268)</b>										
ES1324729-001	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	98.2	----	70	130	----	----
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	99.7	----	70	130	----	----
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	98.4	----	60	130	----	----
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	98.3	----	70	130	----	----
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	108	----	20	130	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3166268)</b>										
ES1324729-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	105	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	113	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3166889)</b>										
ES1324879-002	ME-MW01-0.5	EP080: C6 - C9 Fraction	----	32.5 mg/kg	101	----	70	130	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3166889)</b>										
ES1324879-002	ME-MW01-0.5	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	101	----	70	130	----	----
<b>EP080: BTEXN (QCLot: 3166889)</b>										
ES1324879-002	ME-MW01-0.5	EP080: Benzene	71-43-2	2.5 mg/kg	80.6	----	70	130	----	----
		EP080: Toluene	108-88-3	2.5 mg/kg	92.2	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	88.7	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	86.6	----	70	130	----	----
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	88.3	----	70	130	----	----
		EP080: Naphthalene	91-20-3	2.5 mg/kg	88.0	----	70	130	----	----
<b>EG005T: Total Metals by ICP-AES (QCLot: 3167950)</b>										
ES1324726-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	93.5	----	70	130	----	----
		EG005T: Cadmium	7440-43-9	50 mg/kg	96.7	----	70	130	----	----
		EG005T: Chromium	7440-47-3	50 mg/kg	104	----	70	130	----	----
		EG005T: Copper	7440-50-8	125 mg/kg	99.3	----	70	130	----	----

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 Work Order : ES1324879  
 Client : ENVIRO RESOURCES MANAGEMENT  
 Project : PROJECT SYMPHONY - MP



Sub-Matrix: **SOIL**

				<i>Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report</i>						
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>Spike</i>	<i>Spike Recovery (%)</i>		<i>Recovery Limits (%)</i>		<i>RPDs (%)</i>	
				<i>Concentration</i>	<i>MS</i>	<i>MSD</i>	<i>Low</i>	<i>High</i>	<i>Value</i>	<i>Control Limit</i>
<b>EG005T: Total Metals by ICP-AES (QCLot: 3167950) - continued</b>										
ES1324726-001	Anonymous	EG005T: Lead	7439-92-1	125 mg/kg	95.6	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	99.5	----	70	130	----	----
		EG005T: Selenium	7782-49-2	50 mg/kg	93.2	----	70	130	----	----
		EG005T: Zinc	7440-66-6	125 mg/kg	89.1	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3167951)</b>										
ES1324726-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	98.0	----	70	130	----	----

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1324879</b>	Page	: 1 of 6
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
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Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: PROJECT SYMPHONY - MP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 15-NOV-2013
C-O-C number	: ----	Issue Date	: 25-NOV-2013
Sampler	: TS	No. of samples received	: 10
Order number	: 0207423	No. of samples analysed	: 6
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers





## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EA055: Moisture Content</b>								
<b>Soil Glass Jar - Unpreserved (EA055-103)</b> ME-MW01-0.5, ME-MW03-0.5	ME-MW04-0.5,	14-NOV-2013	----	----	----	20-NOV-2013	28-NOV-2013	✓
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
<b>Snap Lock Bag (EA200)</b> ME-MW01-0.5, ME-MW03-0.5	ME-MW04-0.5,	14-NOV-2013	---	13-MAY-2014	----	25-NOV-2013	24-MAY-2014	✓
<b>EG005T: Total Metals by ICP-AES</b>								
<b>Soil Glass Jar - Unpreserved (EG005T)</b> ME-MW01-0.5, ME-MW03-0.5	ME-MW04-0.5,	14-NOV-2013	20-NOV-2013	13-MAY-2014	✓	20-NOV-2013	13-MAY-2014	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
<b>Soil Glass Jar - Unpreserved (EG035T)</b> ME-MW01-0.5, ME-MW03-0.5	ME-MW04-0.5,	14-NOV-2013	20-NOV-2013	12-DEC-2013	✓	21-NOV-2013	12-DEC-2013	✓
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP071)</b> ME-MW01-0.5, ME-MW03-0.5	ME-MW04-0.5,	14-NOV-2013	20-NOV-2013	28-NOV-2013	✓	20-NOV-2013	30-DEC-2013	✓
<b>EP075(SIM)A: Phenolic Compounds</b>								
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> ME-MW01-0.5, ME-MW03-0.5	ME-MW04-0.5,	14-NOV-2013	20-NOV-2013	28-NOV-2013	✓	20-NOV-2013	30-DEC-2013	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> ME-MW01-0.5, ME-MW03-0.5	ME-MW04-0.5,	14-NOV-2013	20-NOV-2013	28-NOV-2013	✓	20-NOV-2013	30-DEC-2013	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP080: BTEXN</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b> TS, TSC	TB,	13-NOV-2013	19-NOV-2013	27-NOV-2013	✓	21-NOV-2013	27-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> ME-MW01-0.5, ME-MW03-0.5	ME-MW04-0.5,	14-NOV-2013	19-NOV-2013	28-NOV-2013	✓	21-NOV-2013	28-NOV-2013	✓
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b> TS, TSC	TB,	13-NOV-2013	19-NOV-2013	27-NOV-2013	✓	21-NOV-2013	27-NOV-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> ME-MW01-0.5, ME-MW03-0.5	ME-MW04-0.5,	14-NOV-2013	19-NOV-2013	28-NOV-2013	✓	21-NOV-2013	28-NOV-2013	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Moisture Content	EA055-103	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Asbestos Identification in bulk solids	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (2013) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.



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## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### *Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes*

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.
- For all matrices, no Matrix Spike outliers occur.

#### *Regular Sample Surrogates*

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- No Analysis Holding Time Outliers exist.

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.
-

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

<b>Work Order</b> : <b>ES1324879</b>	
<b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : MR JONATHAN LEKAWSKI <b>Address</b> : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Laboratory</b> : Environmental Division Sydney  <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b> : jonathan.lekawski@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800	<b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555
<b>Project</b> : PROJECT SYMPHONY - MP <b>Order number</b> : 0207423 <b>C-O-C number</b> : ---- <b>Site</b> : ---- <b>Sampler</b> : TS	<b>Page</b> : 1 of 2  <b>Quote number</b> : ES2013ENVRES0370 (SY/278/13 V3)  <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement

#### Dates

<b>Date Samples Received</b> : 15-NOV-2013 <b>Client Requested Due Date</b> : 22-NOV-2013	<b>Issue Date</b> : 18-NOV-2013 16:31 <b>Scheduled Reporting Date</b> : <b>22-NOV-2013</b>
--	---

#### Delivery Details

<b>Mode of Delivery</b> : Carrier <b>No. of coolers/boxes</b> : 1 HARD <b>Security Seal</b> : Intact.	<b>Temperature</b> : 12.8°C - Ice bricks present <b>No. of samples received</b> : 10 <b>No. of samples analysed</b> : 6
---	---

#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Asbestos analysis will be conducted by ALS Newcastle.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA200 Asbestos Identification in Soils	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - S-18 (NO MOIST)	TRH(C6-C9)/BTEXN with No Moisture	SOIL - S-27 TRH/BTEXN/PAH/Phenols/8Metals
ES1324879-001	14-NOV-2013 15:00	ME-MW01-0.1	✓					
ES1324879-002	14-NOV-2013 15:00	ME-MW01-0.5		✓	✓			✓
ES1324879-003	14-NOV-2013 10:36	ME-MW04-0.15	✓					
ES1324879-004	14-NOV-2013 10:45	ME-MW04-0.5		✓	✓			✓
ES1324879-005	14-NOV-2013 15:00	ME-MW03-0.1	✓					
ES1324879-006	14-NOV-2013 15:00	ME-MW03-0.5		✓	✓			✓
ES1324879-007	14-NOV-2013 15:00	ME-MW03-1.0	✓					
ES1324879-008	13-NOV-2013 15:00	TS					✓	
ES1324879-009	13-NOV-2013 15:00	TB					✓	
ES1324879-010	13-NOV-2013 15:00	TSC					✓	

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTab )

Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTab )

Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com



# CHAIN OF CUSTODY

ALS Laboratory  
Please Tick →

For the purpose of this Chain of Custody Form, the following definitions apply:  
- **Client:** The person or organization that provides the sample for analysis.  
- **Sampler:** The person who collects the sample.  
- **Analyst:** The person who performs the analysis.  
- **Inspector:** The person who checks the sample and analysis results.  
- **Witness:** The person who is present during the sampling and analysis process.

This Chain of Custody Form is to be used to document the handling of samples from the time they are collected until they are analysed. It is a legal document and must be filled out accurately and honestly.

The Client, Sampler, Analyst, Inspector and Witness must all sign and date this form. The form must be kept with the sample throughout the entire process.

This form is a legal document and must be kept for a minimum of 5 years. It is the responsibility of the Client to ensure that this form is filled out correctly and that the sample is handled in accordance with the requirements of this form.

CLIENT: ERM

OFFICE: Sydney

PROJECT: Project Symphony - MP

ORDER NUMBER: 0207423

PROJECT MANAGER: Jonathan Lekawski

SAMPLER: Rayone Shaw Gavin Powell

COC emailed to ALS? ( YES / NO )

Email Reports to (will default to PM if no other addresses are listed): Symphony.DeltaWest@erm.com

Email Invoices to (will default to PM if no other addresses are listed): Symphony.DeltaWest@erm.com

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

TURNAROUND REQUIREMENTS:  
(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)

Standard TAT (List due date):  
 Non Standard or Urgent TAT (List due date):

ALS QUOTE NO.:

SV/278/13

COC SEQUENCE NUMBER (Circle)

COC: 1 2 3 4 5 6 7  
OF: 1 2 3 4 5 6 7

RECEIVED BY:

DATE/TIME: 15/11/13 08:30

RELINQUISHED BY:

DATE/TIME:

RELINQUISHED BY:

DATE/TIME: 14/11/13 12:30

DATE/TIME:

DATE/TIME:

DATE/TIME:

DATE/TIME:

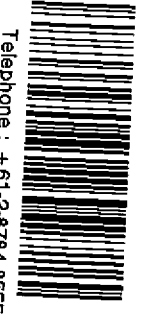
DATE/TIME:

DATE/TIME:

DATE/TIME:

DATE/TIME:

DATE/TIME:



Telephone : + 61 -2-8784 8555

Environmental Division  
Sydney  
Work Order  
**ES1324879**

ALS USE	SAMPLE ID	DATE / TIME	MATRIX	CONTAINER INFORMATION		ANALYSIS REQUIRED							Additional Information			
				TYPE & PRESERVATIVE codes below)	(refer to	TOTAL CONTAINERS	S-27 (8 metals - As, Cd, Cr, Cu, Ni, Pb, Zn, Hg, TRH/BTEX, PAH/Phenols)	Additional Metal - Se	TRH / BTEX / PAH / Phenol	Asbestos	VOC Scan	PCB		Particle Sizing (hydrometer), TOC -		
	1	ME-MW01-0.1	14/11/13	Soil	1 bag, 1 jar	2	X	X	X	X						HOLD
	2	MR-MW01-0.5		"	"	2	X	X	X	X						HOLD
	3	ME-MW04-0.15	10/2/10	"	"	2	X	X	X	X						HOLD
	4	ME-MW04-0.5	10/4/5	"	"	2	X	X	X	X						HOLD
	5	ME-MW03-0.1		"	"	2	X	X	X	X						HOLD
	6	ME-MW03-0.5		"	"	2	X	X	X	X						HOLD
	7	ME-MW05-1.0		"	"	1	X	X	X	X						HOLD
	8	TS	13/11/13			1										
	9	TB	13/11/13			1										
	10	TSC														

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airflight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airflight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Specimen Bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Solids; B = Unpreserved Bag.



## CERTIFICATE OF ANALYSIS

Work Order	: <b>ES1324880</b>	Page	: 1 of 11
Amendment	: <b>(Preliminary Report)</b>		
Client	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: 0207423 SYMPHONY	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: 11734	Date Samples Received	: 15-NOV-2013
Sampler	: GAVIN POWELL	Issue Date	: 27-NOV-2013 09:08
Site	: MT PIPER		
Quote number	: SY/278/13 V3	No. of samples received	: 9
		No. of samples analysed	: 8

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits



Page : 2 of 11
Work Order : ES1324880
Client : ENVIRO RESOURCES MANAGEMENT
Project : 0207423 SYMPHONY

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- EA200 Legend
EA200 'Am' Amosite (brown asbestos)
EA200 'Ch' Chrysotile (white asbestos)
EA200 'Cr' Crocidolite (blue asbestos)
EA200 'Trace' - Asbestos fibres detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.
EA200Q: ALS laboratory procedures and methods used for the identification and quantitation of asbestos are consistent with AS4964-2004 and the requirements of the 2013 NEPM for Assessment of Site Contamination
EA200Q: Asbestos weights and percentages are not covered under the Scope of NATA Accreditation.
Weights of Asbestos are based on extracted bulk asbestos, fibre bundles, and/or ACM and do not include respirable fibres (if present).
Percentages for Asbestos content in ACM are based on the 2013 NEPM default values. All numerical results under this method are approximate and should be used as a guide only.
EP080: Surrogate recovery for sample MH\_GRAB\_01 bias low due to sample matrix interferences, confirmed by re-analysis.



NATA Accredited Laboratory 825
Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Table with 3 columns: Signatories, Position, Accreditation Category. Rows include Ashesh Patel (Inorganic Chemist, Sydney Inorganics), Celine Conceicao (Senior Spectroscopist, Sydney Inorganics), Pabi Subba (Senior Organic Chemist, Sydney Organics), Shobhna Chandra (Metals Coordinator, Sydney Inorganics), Wisam Marassa (Inorganics Coordinator, Sydney Inorganics).

(Preliminary Report)



Page : 3 of 11
Work Order : ES1324880
Client : ENVIRO RESOURCES MANAGEMENT
Project : 0207423 SYMPHONY

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

Table with 5 columns: Client sample ID, Client sampling date / time, and four sample identifiers (MH\_MW03\_0.2, MH\_MW03\_1.0, MH\_MW02\_0.2, MH\_MW01\_0.2, MH\_GRAB\_01). Values include dates like 13-NOV-2013 15:00 and CAS numbers like ES1324880-001.

Table with 5 columns: Compound, CAS Number, LOR, Unit, and four sample identifiers. Values include ES1324880-001, ES1324880-002, ES1324880-003, ES1324880-005, and ES1324880-007.

EA150: Particle Sizing

Table with 9 columns: Compound, CAS Number, LOR, Unit, and four sample identifiers. Rows list particle sizes from +75µm to +75.0mm, all with 'Not Authorised' results.

EA002 : pH (Soils)

Table with 9 columns: Compound, CAS Number, LOR, Unit, and four sample identifiers. Row for pH Value shows 0.1 pH Unit and 5.4 for the first sample, 3.1 for the fourth.

EA055: Moisture Content

Table with 9 columns: Compound, CAS Number, LOR, Unit, and four sample identifiers. Row for Moisture Content (dried @ 103°C) shows 1.0% for the first sample, 13.9, 17.0, 9.3, and 12.6 for others.

EA150: Soil Classification based on Particle Size

Table with 9 columns: Compound, CAS Number, LOR, Unit, and four sample identifiers. Rows list soil classifications: Fines (<75 µm), Sand (>75 µm), Gravel (>2mm), and Cobbles (>6cm), all with 'Not Authorised' results.

EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples

Table with 9 columns: Compound, CAS Number, LOR, Unit, and four sample identifiers. Rows list Asbestos Detected, Asbestos Type, Sample weight (dry), and APPROVED IDENTIFIER, all with 'Not Authorised' results.

EA200Q: Asbestos Quantification (non-NATA)

Table with 9 columns: Compound, CAS Number, LOR, Unit, and four sample identifiers. Rows list Weight Used for % Calculation, Asbestos Containing Material, Fibrous Asbestos, Asbestos Containing Material (as 15% Asbestos in ACM >7mm), and Asbestos Fines and Fibrous Asbestos (<7mm), all with 'Not Authorised' results.

(Preliminary Report)



Page : 4 of 11
Work Order : ES1324880
Client : ENVIRO RESOURCES MANAGEMENT
Project : 0207423 SYMPHONY

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

Table with columns for Compound, CAS Number, LOR, Unit, and five sample IDs (MH\_MW03\_0.2, MH\_MW03\_1.0, MH\_MW02\_0.2, MH\_MW01\_0.2, MH\_GRAB\_01). Rows include sections for Asbestos Quantification, Exchangeable Cations, Total Metals by ICP-AES, Total Recoverable Mercury by FIMS, and Organic Matter.

(Preliminary Report)



Page : 5 of 11
Work Order : ES1324880
Client : ENVIRO RESOURCES MANAGEMENT
Project : 0207423 SYMPHONY

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

Table with columns for Compound, CAS Number, LOR, Unit, and five sample IDs (MH\_MW03\_0.2, MH\_MW03\_1.0, MH\_MW02\_0.2, MH\_MW01\_0.2, MH\_GRAB\_01). Rows include various hydrocarbons like Naphthalene, Acenaphthylene, etc., and summary rows for Total Petroleum Hydrocarbons and Total Recoverable Hydrocarbons.

(Preliminary Report)



Page : 6 of 11
Work Order : ES1324880
Client : ENVIRO RESOURCES MANAGEMENT
Project : 0207423 SYMPHONY

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

Table with columns: Compound, CAS Number, LOR, Unit, MH\_MW03\_0.2, MH\_MW03\_1.0, MH\_MW02\_0.2, MH\_MW01\_0.2, MH\_GRAB\_01. Rows include EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 - Continued, EP080: BTEXN, EP075(SIM)S: Phenolic Compound Surrogates, EP075(SIM)T: PAH Surrogates, and EP080S: TPH(V)/BTEX Surrogates.

(Preliminary Report)



Page : 7 of 11
Work Order : ES1324880
Client : ENVIRO RESOURCES MANAGEMENT
Project : 0207423 SYMPHONY

Analytical Results

Table with columns for Sub-Matrix, Client sample ID, Client sampling date / time, Compound, CAS Number, LOR, Unit, and various test results (EA055, EA200, EA200Q, EG005T, EG035T, EP075(SIM)A).

(Preliminary Report)



Page : 8 of 11
Work Order : ES1324880
Client : ENVIRO RESOURCES MANAGEMENT
Project : 0207423 SYMPHONY

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

Table with columns: Compound, CAS Number, LOR, Unit, MH\_SB04\_0.1, MG\_SB03\_0.2, MG\_SB02\_0.1, and blank columns. Rows include Phenolic Compounds (e.g., 2,6-Dichlorophenol), Polynuclear Aromatic Hydrocarbons (e.g., Naphthalene, Acenaphthylene), and Total Petroleum Hydrocarbons (e.g., C6 - C9 Fraction).



(Preliminary Report)



Page : 9 of 11
Work Order : ES1324880
Client : ENVIRO RESOURCES MANAGEMENT
Project : 0207423 SYMPHONY

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

Table with columns for Compound, CAS Number, LOR, Unit, and sample IDs (MH\_SB04\_0.1, MG\_SB03\_0.2, MG\_SB02\_0.1). Rows include various hydrocarbon fractions (C6-C10, >C10-C16, etc.), BTEXN components (Benzene, Toluene, Ethylbenzene, Xylenes, Naphthalene), Phenolic Compound Surrogates (Phenol-d6, 2-Chlorophenol-D4, 2,4,6-Tribromophenol), PAH Surrogates (2-Fluorobiphenyl, Anthracene-d10, 4-Terphenyl-d14), and TPH(V)/BTEX Surrogates (1,2-Dichloroethane-D4, Toluene-D8, 4-Bromofluorobenzene).

(Preliminary Report)

Page : 10 of 11  
Work Order : ES1324880  
Client : ENVIRO RESOURCES MANAGEMENT  
Project : 0207423 SYMPHONY



**Analytical Results**

**Descriptive Results**

Sub-Matrix: **SOIL**

<i>Method: Compound</i>	<i>Client sample ID - Client sampling date / time</i>	<i>Analytical Results</i>
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>		
EA200: Description	MH_MW03_1.0 - 13-NOV-2013 15:00	NAU
EA200: Description	MH_MW02_0.2 - 13-NOV-2013 15:00	NAU
EA200: Description	MH_MW01_0.2 - 13-NOV-2013 15:00	NAU
EA200: Description	MH_SB04_0.1 - 13-NOV-2013 15:00	NAU
EA200: Description	MG_SB03_0.2 - 13-NOV-2013 15:00	NAU
EA200: Description	MG_SB02_0.1 - 13-NOV-2013 15:00	NAU



Page : 11 of 11  
Work Order : ES1324880  
Client : ENVIRO RESOURCES MANAGEMENT  
Project : 0207423 SYMPHONY

### Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

**CERTIFICATE OF ANALYSIS**

Work Order	: <b>ES1324880</b>	Page	: 1 of 11
Client	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
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Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: 0207423 SYMPHONY	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 15-NOV-2013
C-O-C number	: 11734	Issue Date	: 29-NOV-2013
Sampler	: GAVIN POWELL	No. of samples received	: 9
Site	: MT PIPER	No. of samples analysed	: 8
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EA200 Legend**
- **EA200 'Am' Amosite (brown asbestos)**
- **EA200 'Ch' Chrysotile (white asbestos)**
- **EA200 'Cr' Crocidolite (blue asbestos)**
- **EA200 'Trace' - Asbestos fibres detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres**
- **EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.**
- **EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.**
- **EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.**
- **EA200Q: ALS laboratory procedures and methods used for the identification and quantitation of asbestos are consistent with AS4964-2004 and the requirements of the 2013 NEPM for Assessment of Site Contamination**
- **EA200Q: Asbestos weights and percentages are not covered under the Scope of NATA Accreditation.**  
Weights of Asbestos are based on extracted bulk asbestos, fibre bundles, and/or ACM and do not include respirable fibres (if present).  
Percentages for Asbestos content in ACM are based on the 2013 NEPM default values. All numerical results under this method are approximate and should be used as a guide only.
- **EP080: Surrogate recovery for sample MH\_GRAB\_01 bias low due to sample matrix interferences, confirmed by re-analysis.**



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

## Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

### Signatories

### Position

### Accreditation Category

Ashesh Patel	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Christopher Owler	Team Leader - Asbestos	Newcastle - Asbestos
Hamish Murray	Supervisor - Soils	Newcastle - Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Shaun Spooner	Laboratory Technician	Newcastle - Asbestos
Shobhna Chandra	Metals Coordinator	Sydney Inorganics
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MH_MW03_0.2	MH_MW03_1.0	MH_MW02_0.2	MH_MW01_0.2	MH_GRAB_01
				13-NOV-2013 15:00	13-NOV-2013 15:00	13-NOV-2013 15:00	13-NOV-2013 15:00	13-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324880-001	ES1324880-002	ES1324880-003	ES1324880-005	ES1324880-007
<b>EA150: Particle Sizing</b>								
+75µm	----	1	%	60	----	----	59	----
+150µm	----	1	%	60	----	----	57	----
+300µm	----	1	%	59	----	----	56	----
+425µm	----	1	%	59	----	----	55	----
+600µm	----	1	%	58	----	----	54	----
+1180µm	----	1	%	58	----	----	51	----
+2.36mm	----	1	%	56	----	----	46	----
+4.75mm	----	1	%	52	----	----	37	----
+9.5mm	----	1	%	44	----	----	29	----
+19.0mm	----	1	%	40	----	----	3	----
+37.5mm	----	1	%	34	----	----	<1	----
+75.0mm	----	1	%	<1	----	----	<1	----
<b>EA002 : pH (Soils)</b>								
pH Value	----	0.1	pH Unit	5.4	----	----	3.1	----
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	----	13.9	17.0	9.3	12.6
<b>EA150: Soil Classification based on Particle Size</b>								
Fines (<75 µm)	----	1	%	40	----	----	41	----
Sand (>75 µm)	----	1	%	5	----	----	13	----
Gravel (>2mm)	----	1	%	56	----	----	46	----
Cobbles (>6cm)	----	1	%	<1	----	----	<1	----
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	----	No	No	No	----
Asbestos Type	1332-21-4	-	--	----	-	-	-	----
Sample weight (dry)	----	0.01	g	----	141	130	88.3	----
APPROVED IDENTIFIER:	----	-	--	----	S.SPOONER	S.SPOONER	S.SPOONER	----
<b>EA200Q: Asbestos Quantification (non-NATA)</b>								
Weight Used for % Calculation	----	0.0001	kg	----	0.141	0.130	0.0883	----
Asbestos Containing Material	1332-21-4	0.1	g	----	<0.1	<0.1	<0.1	----
Fibrous Asbestos	----	0.002	g	----	<0.002	<0.002	<0.002	----
Asbestos Containing Material (as 15% Asbestos in ACM >7mm)	1332-21-4	0.01	%	----	<0.02	<0.02	<0.02	----
Asbestos Fines and Fibrous Asbestos (<7mm)	1332-21-4	0.001	%	----	<0.002	<0.002	<0.003	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MH_MW03_0.2	MH_MW03_1.0	MH_MW02_0.2	MH_MW01_0.2	MH_GRAB_01
				13-NOV-2013 15:00	13-NOV-2013 15:00	13-NOV-2013 15:00	13-NOV-2013 15:00	13-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324880-001	ES1324880-002	ES1324880-003	ES1324880-005	ES1324880-007
<b>EA200Q: Asbestos Quantification (non-NATA) - Continued</b>								
Trace Asbestos Detected	----	5	Fibres	----	No	No	No	----
<b>ED008: Exchangeable Cations</b>								
Exchangeable Calcium	----	0.1	meq/100g	5.7	----	----	4.6	----
Exchangeable Magnesium	----	0.1	meq/100g	5.1	----	----	1.9	----
Exchangeable Potassium	----	0.1	meq/100g	0.5	----	----	0.6	----
Exchangeable Sodium	----	0.1	meq/100g	0.1	----	----	<0.1	----
Cation Exchange Capacity	----	0.1	meq/100g	11.4	----	----	7.2	----
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	----	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	----	12	10	18	<5
Cadmium	7440-43-9	1	mg/kg	----	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	----	10	36	<2	2
Copper	7440-50-8	5	mg/kg	----	16	<5	14	13
Lead	7439-92-1	5	mg/kg	----	22	20	24	17
Nickel	7440-02-0	2	mg/kg	----	37	6	<2	2
Zinc	7440-66-6	5	mg/kg	----	89	47	55	70
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	----	<0.1	<0.1	0.1	<0.1
<b>EP004: Organic Matter</b>								
Total Organic Carbon	----	0.5	%	0.6	----	----	2.7	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
2-Chlorophenol	95-57-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
2-Methylphenol	95-48-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	----	<1	<1	<1	----
2-Nitrophenol	88-75-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
Pentachlorophenol	87-86-5	2	mg/kg	----	<2	<2	<2	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MH_MW03_0.2	MH_MW03_1.0	MH_MW02_0.2	MH_MW01_0.2	MH_GRAB_01
				13-NOV-2013 15:00	13-NOV-2013 15:00	13-NOV-2013 15:00	13-NOV-2013 15:00	13-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324880-001	ES1324880-002	ES1324880-003	ES1324880-005	ES1324880-007
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	0.5
Phenanthrene	85-01-8	0.5	mg/kg	----	<0.5	<0.5	1.7	3.6
Anthracene	120-12-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	----	<0.5	<0.5	<0.5	1.6
Pyrene	129-00-0	0.5	mg/kg	----	<0.5	<0.5	<0.5	1.3
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	1.0
Chrysene	218-01-9	0.5	mg/kg	----	<0.5	<0.5	<0.5	1.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	0.9
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	----	<0.5	<0.5	1.7	10.4
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	----	0.6	0.6	0.6	0.8
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	----	1.2	1.2	1.2	1.3
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	----	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	----	<50	<50	<50	80
C15 - C28 Fraction	----	100	mg/kg	----	<100	<100	200	540
C29 - C36 Fraction	----	100	mg/kg	----	<100	<100	<100	290
^ C10 - C36 Fraction (sum)	----	50	mg/kg	----	<50	<50	200	910
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	----	<10	<10	<10	11
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	----	<10	<10	<10	11
>C10 - C16 Fraction	>C10_C16	50	mg/kg	----	<50	<50	<50	130
>C16 - C34 Fraction	----	100	mg/kg	----	<100	<100	240	720
>C34 - C40 Fraction	----	100	mg/kg	----	<100	<100	<100	150
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	----	<50	<50	240	1000





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				MH_MW03_0.2	MH_MW03_1.0	MH_MW02_0.2	MH_MW01_0.2	MH_GRAB_01
				13-NOV-2013 15:00	13-NOV-2013 15:00	13-NOV-2013 15:00	13-NOV-2013 15:00	13-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1324880-001	ES1324880-002	ES1324880-003	ES1324880-005	ES1324880-007
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 - Continued</b>								
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	----	<50	<50	<50	130
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	----	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	----	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	----	<1	<1	<1	<1
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	----	94.4	93.0	97.2	86.0
2-Chlorophenol-D4	93951-73-6	0.1	%	----	104	97.8	102	95.8
2,4,6-Tribromophenol	118-79-6	0.1	%	----	80.3	85.7	84.9	56.9
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	----	83.8	88.9	90.7	79.5
Anthracene-d10	1719-06-8	0.1	%	----	86.4	89.2	90.0	84.8
4-Terphenyl-d14	1718-51-0	0.1	%	----	88.2	93.8	94.9	90.6
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	84.0	74.3	75.2	78.5
Toluene-D8	2037-26-5	0.1	%	----	94.0	89.8	91.9	73.8
4-Bromofluorobenzene	460-00-4	0.1	%	----	89.3	89.6	80.3	51.2



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				MH_SB04_0.1	MG_SB03_0.2	MG_SB02_0.1	----	----
				13-NOV-2013 15:00	13-NOV-2013 15:00	13-NOV-2013 15:00	----	----
Compound	CAS Number	LOR	Unit	ES1324880-008	ES1324880-009	ES1324880-010	----	----
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	17.3	----	----	----	----
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	----	----
Asbestos Type	1332-21-4	-	--	-	-	-	----	----
Sample weight (dry)	----	0.01	g	136	101	83.0	----	----
APPROVED IDENTIFIER:	----	-	--	S.SPOONER	S.SPOONER	S.SPOONER	----	----
<b>EA200Q: Asbestos Quantification (non-NATA)</b>								
Weight Used for % Calculation	----	0.0001	kg	0.136	0.101	0.0830	----	----
Asbestos Containing Material	1332-21-4	0.1	g	<0.1	<0.1	<0.1	----	----
Fibrous Asbestos	----	0.002	g	<0.002	<0.002	<0.002	----	----
Asbestos Containing Material (as 15% Asbestos in ACM >7mm)	1332-21-4	0.01	%	<0.02	<0.02	<0.02	----	----
Asbestos Fines and Fibrous Asbestos (<7mm)	1332-21-4	0.001	%	<0.002	<0.002	<0.003	----	----
Trace Asbestos Detected	----	5	Fibres	No	No	No	----	----
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	----	----	----	----
Arsenic	7440-38-2	5	mg/kg	7	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg	3	----	----	----	----
Copper	7440-50-8	5	mg/kg	12	----	----	----	----
Lead	7439-92-1	5	mg/kg	19	----	----	----	----
Nickel	7440-02-0	2	mg/kg	7	----	----	----	----
Zinc	7440-66-6	5	mg/kg	70	----	----	----	----
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	----	----	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	----	----	----	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	----	----	----	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	----	----	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	----	----	----	----
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	----	----	----	----
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	----	----	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				MH_SB04_0.1	MG_SB03_0.2	MG_SB02_0.1	----	----
Client sampling date / time				13-NOV-2013 15:00	13-NOV-2013 15:00	13-NOV-2013 15:00	----	----
Compound	CAS Number	LOR	Unit	ES1324880-008	ES1324880-009	ES1324880-010	----	----
<b>EP075(SIM)A: Phenolic Compounds - Continued</b>								
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	----	----	----	----
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	----	----	----	----
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	----	----	----	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	----	----	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	1.0	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	----	----	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	----	----	----
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	1.0	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	----	----	----	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg	190	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	190	----	----	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MH_SB04_0.1	MG_SB03_0.2	MG_SB02_0.1	----	----
				13-NOV-2013 15:00	13-NOV-2013 15:00	13-NOV-2013 15:00	----	----
Compound	CAS Number	LOR	Unit	ES1324880-008	ES1324880-009	ES1324880-010	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 - Continued</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	----	----	----	----
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	220	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	220	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	----	----	----	----
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	----	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg	<1	----	----	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	80.5	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	94.0	----	----	----	----
2,4,6-Tribromophenol	118-79-6	0.1	%	76.5	----	----	----	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	83.0	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%	83.8	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	87.3	----	----	----	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	80.1	----	----	----	----
Toluene-D8	2037-26-5	0.1	%	84.1	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	73.6	----	----	----	----



## Analytical Results

### Descriptive Results

Sub-Matrix: **SOIL**

<i>Method: Compound</i>	<i>Client sample ID - Client sampling date / time</i>	<i>Analytical Results</i>
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>		
EA200: Description	MH_MW03_1.0 - 13-NOV-2013 15:00	Mid grey - brown clay soil with dark grey and orange rocks plus a trace of vegetation.
EA200: Description	MH_MW02_0.2 - 13-NOV-2013 15:00	Light brown clay soil with orange and red rocks plus a trace of vegetation.
EA200: Description	MH_MW01_0.2 - 13-NOV-2013 15:00	Mid grey soil with grey rocks plus a trace of vegetation.
EA200: Description	MH_SB04_0.1 - 13-NOV-2013 15:00	Mid grey soil with grey rocks plus a trace of vegetation.
EA200: Description	MG_SB03_0.2 - 13-NOV-2013 15:00	Mid brown clay soil with grey and orange rocks plus a trace of vegetation.
EA200: Description	MG_SB02_0.1 - 13-NOV-2013 15:00	Mid yellow - brown clay soil with grey and orange rocks plus a trace of vegetation.



## Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: ES1324880</b>	<b>Page</b>	<b>: 1 of 11</b>
<b>Client</b>	<b>: ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	<b>: Environmental Division Sydney</b>
<b>Contact</b>	<b>: MR JONATHAN LEKAWSKI</b>	<b>Contact</b>	<b>: Barbara Hanna</b>
<b>Address</b>	<b>: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007</b>	<b>Address</b>	<b>: 277-289 Woodpark Road Smithfield NSW Australia 2164</b>
<b>E-mail</b>	<b>: jonathan.lekawski@erm.com</b>	<b>E-mail</b>	<b>: Barbara.Hanna@alsglobal.com</b>
<b>Telephone</b>	<b>: +61 02 8584 8888</b>	<b>Telephone</b>	<b>: +61 2 8784 8555</b>
<b>Facsimile</b>	<b>: +61 02 8584 8800</b>	<b>Facsimile</b>	<b>: +61 2 8784 8555</b>
<b>Project</b>	<b>: 0207423 SYMPHONY</b>	<b>QC Level</b>	<b>: NEPM 2013 Schedule B(3) and ALS QCS3 requirement</b>
<b>Site</b>	<b>: MT PIPER</b>	<b>Date Samples Received</b>	<b>: 15-NOV-2013</b>
<b>C-O-C number</b>	<b>: 11734</b>	<b>Issue Date</b>	<b>: 29-NOV-2013</b>
<b>Sampler</b>	<b>: GAVIN POWELL</b>	<b>No. of samples received</b>	<b>: 9</b>
<b>Order number</b>	<b>: ----</b>	<b>No. of samples analysed</b>	<b>: 8</b>
<b>Quote number</b>	<b>: SY/278/13 V3</b>		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :  
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
RPD = Relative Percentage Difference  
# = Indicates failed QC



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

## Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ashesh Patel	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Christopher Owler	Team Leader - Asbestos	Newcastle - Asbestos
Hamish Murray	Supervisor - Soils	Newcastle - Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Shaun Spooner	Laboratory Technician	Newcastle - Asbestos
Shobhna Chandra	Metals Coordinator	Sydney Inorganics
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics





### Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EA002 : pH (Soils) (QC Lot: 3165542)</b>									
ES1324349-097	Anonymous	EA002: pH Value	----	0.1	pH Unit	8.5	8.3	2.8	0% - 20%
ES1324934-003	Anonymous	EA002: pH Value	----	0.1	pH Unit	4.8	4.8	0.0	0% - 20%
<b>EA055: Moisture Content (QC Lot: 3173938)</b>									
ES1324763-002	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	12.9	11.7	9.8	0% - 50%
ES1324880-008	MH_SB04_0.1	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	17.3	17.4	0.0	0% - 50%
<b>ED008: Exchangeable Cations (QC Lot: 3173306)</b>									
ES1324880-001	MH_MW03_0.2	ED008: Exchangeable Calcium	----	0.1	meq/100g	5.7	5.6	1.9	0% - 20%
		ED008: Exchangeable Magnesium	----	0.1	meq/100g	5.1	5.1	0.0	0% - 20%
		ED008: Exchangeable Potassium	----	0.1	meq/100g	0.5	0.5	0.0	0% - 20%
		ED008: Exchangeable Sodium	----	0.1	meq/100g	0.1	0.1	0.0	0% - 20%
		ED008: Cation Exchange Capacity	----	0.1	meq/100g	11.4	11.3	0.9	0% - 20%
ES1324911-006	Anonymous	ED008: Exchangeable Calcium	----	0.1	meq/100g	9.6	9.4	1.8	0% - 20%
		ED008: Exchangeable Magnesium	----	0.1	meq/100g	4.0	4.0	0.0	0% - 20%
		ED008: Exchangeable Potassium	----	0.1	meq/100g	0.5	0.5	0.0	0% - 20%
		ED008: Exchangeable Sodium	----	0.1	meq/100g	0.6	0.6	0.0	0% - 20%
		ED008: Cation Exchange Capacity	----	0.1	meq/100g	14.7	14.6	1.1	0% - 20%
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3173966)</b>									
ES1324880-002	MH_MW03_1.0	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	10	11	12.6	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	37	35	4.4	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	12	11	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	16	15	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	22	16	28.6	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	89	89	0.0	0% - 50%
ES1324881-006	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	16	19	16.2	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	24	46	61.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	18	32	52.9	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	22	28	22.9	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	48	71	37.4	0% - 50%
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3173967)</b>									
ES1324880-002	MH_MW03_1.0	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3173967) - continued</b>									
ES1324881-006	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP004: Organic Matter (QC Lot: 3178206)</b>									
ES1324837-002	Anonymous	EP004: Total Organic Carbon	----	0.5	%	<0.5	<0.5	0.0	No Limit
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3166073)</b>									
ES1324838-001	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
ES1324880-007	MH_GRAB_01	EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
		EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit		
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit		
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3166073)</b>									
ES1324838-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3166073) - continued</b>									
ES1324838-001	Anonymous	EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1324880-007	MH_GRAB_01	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	0.5	0.6	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	3.6	3.8	5.1	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	1.6	1.7	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	1.3	1.4	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	1.0	1.0	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	1.5	1.6	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	0.9	1.0	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	10.4	11.1	6.5	0% - 20%
EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3166072)</b>									
ES1324838-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1324880-007	MH_GRAB_01	EP071: C15 - C28 Fraction	----	100	mg/kg	540	670	21.5	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	290	360	20.3	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	80	60	19.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3168287)</b>									
ES1324880-002	MH_MW03_1.0	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1325014-006	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3166072)</b>									
ES1324838-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3166072) - continued</b>									
ES1324838-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
ES1324880-007	MH_GRAB_01	EP071: >C16 - C34 Fraction	----	100	mg/kg	720	960	28.5	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	150	160	7.6	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	130	150	14.2	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3168287)</b>									
ES1324880-002	MH_MW03_1.0	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES1325014-006	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3168287)</b>									
ES1324880-002	MH_MW03_1.0	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES1325014-006	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	0.6	0.9	32.1	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit



### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>ED008: Exchangeable Cations (QCLot: 3173306)</b>									
ED008: Exchangeable Calcium	----	0.1	meq/100g	<0.1	1 meq/100g	127	90	128	
ED008: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	1.67 meq/100g	98.7	86	120	
ED008: Exchangeable Potassium	----	0.1	meq/100g	<0.1	0.51 meq/100g	107	85	135	
ED008: Exchangeable Sodium	----	0.1	meq/100g	<0.1	0.87 meq/100g	111	86	128	
ED008: Cation Exchange Capacity	----	0.1	meq/100g	<0.1	----	----	----	----	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3173966)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	111	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	99.0	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	110	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	106	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	99.4	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	110	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	96.4	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	105	81	133	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3173967)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	86.4	66	112	
<b>EP004: Organic Matter (QCLot: 3178206)</b>									
EP004: Total Organic Carbon	----	0.5	%	<0.5	2.66 %	99.8	84	106	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3166073)</b>									
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	97.3	74	116	
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	93.4	74	116	
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	110	72	116	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	109	69	123	
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	84.2	60.3	117	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	87.2	69	117	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	88.1	68	112	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	88.2	73	117	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	88.6	76.4	114	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	83.4	57	111	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	83.8	68.9	112	
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	25.1	3.9	57	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3166073)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	93.2	80	124	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	94.2	77	123	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3166073) - continued</b>									
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	96.6	79	123	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	100	77	123	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	92.5	79	123	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	102	79	123	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	94.9	79	123	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	96.1	79	125	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	96.6	73	121	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	101	81	123	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	94.1	70	118	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	101	77	123	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	92.3	76	122	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	86.7	71	113	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	86.1	71.7	113	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	85.2	72.4	114	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3166072)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	78.4	71	131	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	85.2	74	138	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	78.2	64	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3168287)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	111	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3166072)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	80.6	70	130	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	83.7	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	
		50	mg/kg	----	150 mg/kg	69.4	63	131	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3168287)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	113	68.4	128	
<b>EP080: BTEXN (QCLot: 3168287)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	88.4	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	93.4	62	128	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	99.6	58	118	
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	101	60	120	
	106-42-3								
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	103	60	120	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	94.2	62	138	

**Matrix Spike (MS) Report**



The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%) MS	Recovery Limits (%)	
					Low	High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3173966)</b>							
ES1324880-002	MH_MW03_1.0	EG005T: Arsenic	7440-38-2	50 mg/kg	99.1	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	99.6	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	105	70	130
		EG005T: Copper	7440-50-8	125 mg/kg	109	70	130
		EG005T: Lead	7439-92-1	125 mg/kg	96.2	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	117	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	108	70	130
		EG005T: Zinc	7440-66-6	125 mg/kg	112	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3173967)</b>							
ES1324880-002	MH_MW03_1.0	EG035T: Mercury	7439-97-6	5 mg/kg	98.5	70	130
<b>EP004: Organic Matter (QCLot: 3178206)</b>							
ES1324837-012	Anonymous	EP004: Total Organic Carbon	----	2.66 %	11.2	----	----
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3166073)</b>							
ES1324838-001	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	81.6	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	85.7	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	80.0	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	80.6	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	53.2	20	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3166073)</b>							
ES1324838-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	83.4	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	83.4	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3166072)</b>							
ES1324838-001	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	102	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	97.4	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	84.7	52	132
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3168287)</b>							
ES1324880-002	MH_MW03_1.0	EP080: C6 - C9 Fraction	----	32.5 mg/kg	100	70	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3166072)</b>							
ES1324838-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	99.5	73	137
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	79.8	53	131
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	63.8	52	132
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3168287)</b>							
ES1324880-002	MH_MW03_1.0	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	99.0	70	130
<b>EP080: BTEXN (QCLot: 3168287)</b>							





Sub-Matrix: SOIL

				Matrix Spike (MS) Report				
				Spike Concentration	Spike Recovery(%) MS	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EP080: BTEXN (QCLot: 3168287) - continued</b>								
ES1324880-002	MH_MW03_1.0	EP080: Benzene	71-43-2	2.5 mg/kg	75.3	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	73.0	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	78.8	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	84.9	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	83.1	70	130	
	EP080: Naphthalene	91-20-3	2.5 mg/kg	78.2	70	130		

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3166072)</b>										
ES1324838-001	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	102	----	73	137	----	----
		EP071: C15 - C28 Fraction	----	3140 mg/kg	97.4	----	53	131	----	----
		EP071: C29 - C36 Fraction	----	2860 mg/kg	84.7	----	52	132	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3166072)</b>										
ES1324838-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	99.5	----	73	137	----	----
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	79.8	----	53	131	----	----
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	63.8	----	52	132	----	----
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3166073)</b>										
ES1324838-001	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	81.6	----	70	130	----	----
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	85.7	----	70	130	----	----
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	80.0	----	60	130	----	----
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	80.6	----	70	130	----	----
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	53.2	----	20	130	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3166073)</b>										
ES1324838-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	83.4	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	83.4	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3168287)</b>										
ES1324880-002	MH_MW03_1.0	EP080: C6 - C9 Fraction	----	32.5 mg/kg	100	----	70	130	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3168287)</b>										
ES1324880-002	MH_MW03_1.0	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	99.0	----	70	130	----	----
<b>EP080: BTEXN (QCLot: 3168287)</b>										
ES1324880-002	MH_MW03_1.0	EP080: Benzene	71-43-2	2.5 mg/kg	75.3	----	70	130	----	----





Sub-Matrix: SOIL

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report							
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
				Concentration	MS	MSD	Low	High	Value	Control Limit	
<b>EP080: BTEXN (QCLot: 3168287) - continued</b>											
ES1324880-002	MH_MW03_1.0	EP080: Toluene	108-88-3	2.5 mg/kg	73.0	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	78.8	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	84.9	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	83.1	----	70	130	----	----	
		EP080: Naphthalene	91-20-3	2.5 mg/kg	78.2	----	70	130	----	----	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3173966)</b>											
ES1324880-002	MH_MW03_1.0	EG005T: Arsenic	7440-38-2	50 mg/kg	99.1	----	70	130	----	----	
		EG005T: Cadmium	7440-43-9	50 mg/kg	99.6	----	70	130	----	----	
		EG005T: Chromium	7440-47-3	50 mg/kg	105	----	70	130	----	----	
		EG005T: Copper	7440-50-8	125 mg/kg	109	----	70	130	----	----	
		EG005T: Lead	7439-92-1	125 mg/kg	96.2	----	70	130	----	----	
		EG005T: Nickel	7440-02-0	50 mg/kg	117	----	70	130	----	----	
		EG005T: Selenium	7782-49-2	50 mg/kg	108	----	70	130	----	----	
		EG005T: Zinc	7440-66-6	125 mg/kg	112	----	70	130	----	----	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3173967)</b>											
ES1324880-002	MH_MW03_1.0	EG035T: Mercury	7439-97-6	5 mg/kg	98.5	----	70	130	----	----	
<b>EP004: Organic Matter (QCLot: 3178206)</b>											
ES1324837-012	Anonymous	EP004: Total Organic Carbon	----	2.66 %	11.2	----	----	----	----	----	



## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1324880</b>	Page	: 1 of 7
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: 0207423 SYMPHONY	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: MT PIPER	Date Samples Received	: 15-NOV-2013
C-O-C number	: 11734	Issue Date	: 29-NOV-2013
Sampler	: GAVIN POWELL	No. of samples received	: 9
Order number	: ----	No. of samples analysed	: 8
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EA002 : pH (Soils)</b>							
<b>Soil Glass Jar - Unpreserved (EA002)</b> MH_MW03_0.2, MH_MW01_0.2	13-NOV-2013	19-NOV-2013	20-NOV-2013	✓	19-NOV-2013	19-NOV-2013	✓
<b>EA055: Moisture Content</b>							
<b>Soil Glass Jar - Unpreserved (EA055-103)</b> MH_MW03_1.0, MH_MW01_0.2, MH_SB04_0.1 MH_MW02_0.2, MH_GRAB_01,	13-NOV-2013	----	----	----	22-NOV-2013	27-NOV-2013	✓
<b>EA150: Particle Sizing</b>							
<b>Snap Lock Bag (EA150)</b> MH_MW03_0.2, MH_MW01_0.2	13-NOV-2013	---	12-MAY-2014	----	28-NOV-2013	27-MAY-2014	✓
<b>EA150: Soil Classification based on Particle Size</b>							
<b>Snap Lock Bag (EA150)</b> MH_MW03_0.2, MH_MW01_0.2	13-NOV-2013	---	12-MAY-2014	----	28-NOV-2013	27-MAY-2014	✓
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>							
<b>Snap Lock Bag (EA200)</b> MH_MW03_1.0, MH_MW01_0.2, MG_SB03_0.2 MH_MW02_0.2, MH_SB04_0.1, MG_SB02_0.1	13-NOV-2013	---	12-MAY-2014	----	28-NOV-2013	27-MAY-2014	✓
<b>ED008: Exchangeable Cations</b>							
<b>Soil Glass Jar - Unpreserved (ED008)</b> MH_MW03_0.2, MH_MW01_0.2	13-NOV-2013	25-NOV-2013	11-DEC-2013	✓	25-NOV-2013	11-DEC-2013	✓
<b>EG005T: Total Metals by ICP-AES</b>							
<b>Soil Glass Jar - Unpreserved (EG005T)</b> MH_MW03_1.0, MH_MW01_0.2, MH_SB04_0.1 MH_MW02_0.2, MH_GRAB_01,	13-NOV-2013	22-NOV-2013	12-MAY-2014	✓	24-NOV-2013	12-MAY-2014	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>							
<b>Soil Glass Jar - Unpreserved (EG035T)</b> MH_MW03_1.0, MH_MW01_0.2, MH_SB04_0.1 MH_MW02_0.2, MH_GRAB_01,	13-NOV-2013	22-NOV-2013	11-DEC-2013	✓	25-NOV-2013	11-DEC-2013	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP004: Organic Matter</b>								
<b>Soil Glass Jar - Unpreserved (EP004)</b> MH_MW03_0.2, MH_MW01_0.2	13-NOV-2013	26-NOV-2013	11-DEC-2013	✓	26-NOV-2013	11-DEC-2013	✓	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
<b>Soil Glass Jar - Unpreserved (EP071)</b> MH_MW03_1.0, MH_MW01_0.2, MH_SB04_0.1 MH_MW02_0.2, MH_GRAB_01,	13-NOV-2013	22-NOV-2013	27-NOV-2013	✓	22-NOV-2013	01-JAN-2014	✓	
<b>EP075(SIM)A: Phenolic Compounds</b>								
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MH_MW03_1.0, MH_MW01_0.2, MH_SB04_0.1 MH_MW02_0.2, MH_SB04_0.1	13-NOV-2013	22-NOV-2013	27-NOV-2013	✓	22-NOV-2013	01-JAN-2014	✓	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MH_MW03_1.0, MH_MW01_0.2, MH_SB04_0.1 MH_MW02_0.2, MH_GRAB_01,	13-NOV-2013	22-NOV-2013	27-NOV-2013	✓	22-NOV-2013	01-JAN-2014	✓	
<b>EP080: BTEXN</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b> MH_MW03_1.0, MH_MW01_0.2, MH_SB04_0.1 MH_MW02_0.2, MH_GRAB_01,	13-NOV-2013	21-NOV-2013	27-NOV-2013	✓	25-NOV-2013	27-NOV-2013	✓	
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b> MH_MW03_1.0, MH_MW01_0.2, MH_SB04_0.1 MH_MW02_0.2, MH_GRAB_01,	13-NOV-2013	21-NOV-2013	27-NOV-2013	✓	25-NOV-2013	27-NOV-2013	✓	



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Exchangeable Cations with pre-treatment	ED008	2	17	11.8	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Moisture Content	EA055-103	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organic Matter	EP004	1	8	12.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
pH (1:5)	EA002	2	17	11.8	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
Exchangeable Cations with pre-treatment	ED008	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organic Matter	EP004	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
Exchangeable Cations with pre-treatment	ED008	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organic Matter	EP004	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
Organic Matter	EP004	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH (1:5)	EA002	SOIL	(APHA 21st ed., 4500H+) pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM (2013) Schedule B(3) (Method 103)
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Particle Size Analysis (Sieving)	EA150	SOIL	Particle Size Analysis by Sieving according to AS1289.3.6.1 - 2009
Asbestos Identification in bulk solids	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples
Asbestos - Quantitative Analysis	* EA200Q	SOIL	Asbestos Materials Content with Confirmation of Identification by AS 4964 - 2004 Asbestos
Exchangeable Cations with pre-treatment	ED008	SOIL	Rayment & Higginson (1992) Method 15A2. Soluble salts are removed from the sample prior to analysis. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. This method is compliant with NEPM (2013) Schedule B(3) (Method 301)
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Organic Matter	EP004	SOIL	AS1289.4.1.1 - 1997., Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM (2013) Schedule B(3) (Method 105)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (2013) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Exchangeable Cations Preparation Method	ED007PR	SOIL	Rayment & Higginson (1992) method 15A1. A 1M NH <sub>4</sub> Cl extraction by end over end tumbling at a ratio of 1:20. There is no pretreatment for soluble salts. Extracts can be run by ICP for cations.
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of distilled water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.



<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Organic Matter	EP004-PR	SOIL	AS1289.4.1.1 - 1997., Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM (2013) Schedule B(3) (Method 105)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option A - Concentrating)	ORG17A	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.



## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.
- For all matrices, no Matrix Spike outliers occur.

#### Regular Sample Surrogates

Sub-Matrix: SOIL

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Samples Submitted</b>							
EP080S: TPH(V)/BTEX Surrogates	ES1324880-007	MH_GRAB_01	Toluene-D8	2037-26-5	73.8 %	73.9-132.1 %	Recovery less than lower data quality objective
EP080S: TPH(V)/BTEX Surrogates	ES1324880-007	MH_GRAB_01	4-Bromofluorobenzene	460-00-4	51.2 %	71.6-130.0 %	Recovery less than lower data quality objective

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- No Analysis Holding Time Outliers exist.

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.



## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

<b>Work Order</b> : <b>ES1324880</b>	
<b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : MR JONATHAN LEKAWSKI <b>Address</b> : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Laboratory</b> : Environmental Division Sydney  <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b> : jonathan.lekawski@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800	<b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555
<b>Project</b> : 0207423 SYMPHONY <b>Order number</b> : ---- <b>C-O-C number</b> : 11734 <b>Site</b> : MT PIPER <b>Sampler</b> : GAVIN POWELL	<b>Page</b> : 1 of 3  <b>Quote number</b> : ES2013ENVRES0370 (SY/278/13 V3)  <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement

#### Dates

<b>Date Samples Received</b> : 15-NOV-2013 <b>Client Requested Due Date</b> : 26-NOV-2013	<b>Issue Date</b> : 19-NOV-2013 09:15 <b>Scheduled Reporting Date</b> : <b>26-NOV-2013</b>
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#### Delivery Details

<b>Mode of Delivery</b> : Carrier <b>No. of coolers/boxes</b> : 1 HARD <b>Security Seal</b> : Intact.	<b>Temperature</b> : 12.8°C - Ice bricks present <b>No. of samples received</b> : 9 <b>No. of samples analysed</b> : 8
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#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Asbestos and Particle Sizing analysis will be conducted by ALS Newcastle.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA002 pH (1:5)	SOIL - EA150* Particle Size Analysis by Sieving (Default sieves from ASBESTOS)	SOIL - EA200N Asbestos Quantitation by WANEPM Guidelines - Asbestos	SOIL - ED008 Exchangeable Cations with pre-treatment -All	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP004 (Carbon) Total Organic Carbon (Calc.)	SOIL - S-26 8 metals/TRHIBTEXN/PAH
ES1324880-001	13-NOV-2013 15:00	MH_MW03_0.2		✓	✓		✓		✓	
ES1324880-002	13-NOV-2013 15:00	MH_MW03_1.0				✓		✓		
ES1324880-003	13-NOV-2013 15:00	MH_MW02_0.2				✓		✓		
ES1324880-005	13-NOV-2013 15:00	MH_MW01_0.2		✓	✓	✓	✓	✓	✓	
ES1324880-006	13-NOV-2013 15:00	MH_MW01_1.0	✓							
ES1324880-007	13-NOV-2013 15:00	MH_GRAB_01						✓		✓
ES1324880-008	13-NOV-2013 15:00	MH_SB04_0.1				✓		✓		
ES1324880-009	13-NOV-2013 15:00	MG_SB03_0.2				✓				
ES1324880-010	13-NOV-2013 15:00	MG_SB02_0.1				✓				

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - S-27 TRHIBTEXN/PAH/Phenols/8Metals
ES1324880-002	13-NOV-2013 15:00	MH_MW03_1.0	✓
ES1324880-003	13-NOV-2013 15:00	MH_MW02_0.2	✓
ES1324880-005	13-NOV-2013 15:00	MH_MW01_0.2	✓
ES1324880-008	13-NOV-2013 15:00	MH_SB04_0.1	✓

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Attachment - Report ( SUBCO )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
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### SYMPHONY DELTAWEST

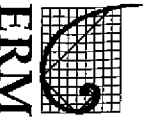
- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Attachment - Report ( SUBCO )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

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### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com



- Sydney
- Melbourne
- Brisbane
- Perth
- Hunter Valley
- North Coast
- Other

Grand Floor, 33 Saunders Street, Pyrmont, NSW, 2009. (ph) 02 8584 8888 (fax) 02 8584 8800  
 Level 3, Yarra Tower, WTC, 18-38 Siddley Street, Docklands, VIC, 3005. (ph) 03 9696 8011 (fax) 03 9696 8022  
 Level 1, 60 Leichhardt Street, Spring Hill, QLD, 4004. (ph) 07 3838 8383 (fax) 07 3838 8381  
 Level 6, Grain Pool Bld, 172 St Georges Ter, WA, 6850. (ph) 08 9321 5200 (fax) 08 9321 5262  
 53 Bonville Avenue, Thornion, NSW, 2922. (ph) 02 4964 2150 (fax) 02 4964 2152  
 Suite 3/146 Gordon Street, Port Macquarie, NSW, 2444. (ph) 02 6584 7155 (fax) 02 6584 7160

Project No: 0202423  
 Project Name: Symphony  
 Project Location: WA RPS  
 Project Manager: Jonathan Lewanski  
 Sampler: Camille

COC Number: A 11734  
 Laboratory: ALS

General Analysis Requirements

1. Turn Around Time (please tick):  1 Day  2 Days  3 Days  Normal (AT)
2. Do you wish any sediment layers in water to be excluded from extractions?
3. Additional QA/QC reported where sample batches are < 10 samples?
4. % of extraneous material removed from samples to be reported as per NEMP 5.1.17?

Laboratory Number	Sample ID	Sample Depth	Sample Date	Sample Time	Matrix			Preservation			Containers (number/type)	BTEX	TPH (C6-C9 P & T) + TPH (C10-C36)	Speciated TPH	VOC Scan (USEPA 8260 List)	SVOC Scan (USEPA 8270 List)	OC OP Pesticides	PAH	Phenols	PCB	Metals* (dissolved / total)	CEC, TOC, PH, PSD	Asbestos <sup>by weight</sup> <sub>by weight</sub>	MOLD	Other Comments on sample (eg: high voc, highly contaminated, special detection limits etc etc)
					Soil	Water	Other	Ice	Acid	Filter															
1	MH-MW03-0.2		13/11		X			X			1										X				
2	MH-MW03-1.0										2	X						X	X	X	X				
3	MH-MW02-0.2										2	X						X	X	X	X				
4	MH-MW01-0.2										3	X						X	X	X	X				
5	MH-MW01-0.2										1	X						X	X	X	X				
6	MH-MW01-1.0										1							X	X	X	X				
7	MH-Carb-01										1	X						X	X	X	X				Contains coal fines
8	MH-SB09-0.1										2	X						X	X	X	X				
9	MH-SB03-0.2										2	X						X	X	X	X				
10	MH-SB02-0.1		13/11			X			X		2							X	X	X	X				

Environmental Division  
 Sydney  
 Work Order  
**ES1324880**

Telephone: +61-2-8784 8555

\*Metals (traceable)  
 As Cd Cr Cu Hg Ni Pb Zn

Comments: *Re*

Relinquished by: *M. Johnson* Signed: *[Signature]* Date/Time: *14/11/13 3:00pm*

Relinquished by: *[Signature]* Signed: *[Signature]* Date/Time: *15/11 6:50*

Received by: *[Signature]* Date/Time: *15/11*

## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>ES1325218</b> <b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : MR JONATHAN LEKAWSKI <b>Address</b> : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007  <b>E-mail</b> : jonathan.lekawski@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800 <b>Project</b> : PROJECT SYMPHONY - MP <b>Order number</b> : 0207423 <b>C-O-C number</b> : ---- <b>Sampler</b> : TS, GP <b>Site</b> : ----  <b>Quote number</b> : SY/278/13 V3	<b>Page</b> : 1 of 6  <b>Laboratory</b> : Environmental Division Sydney <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164  <b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555 <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement  <b>Date Samples Received</b> : 20-NOV-2013 <b>Issue Date</b> : 02-DEC-2013  <b>No. of samples received</b> : 10 <b>No. of samples analysed</b> : 4
--	--

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

### *Signatories*

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Christopher Owler	Team Leader - Asbestos	Newcastle - Asbestos
Pabi Subba	Senior Organic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Raymond Commodor	Instrument Chemist	Sydney Inorganics



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EA200 Legend**
- **EA200 'Am' Amosite (brown asbestos)**
- **EA200 'Ch' Chrysotile (white asbestos)**
- **EA200 'Cr' Crocidolite (blue asbestos)**
- **EA200 'Trace' - Asbestos fibres detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres**
- **EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.**
- **EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.**
- **EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.**
- **EG005: Poor precision was obtained for Zinc on sample ES1325279 #005. Results have been confirmed by re-extraction and reanalysis.**



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ME_MW02_0.5	MK_SB61_0.4	MB_MW03_3.0	MB_MW04_3.5	----
				14-NOV-2013 15:00	14-NOV-2013 15:00	18-NOV-2013 15:00	18-NOV-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1325218-003	ES1325218-005	ES1325218-006	ES1325218-009	----
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	22.8	15.1	10.4	12.3	----
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	----	----	----
Asbestos Type	1332-21-4	0.1	--	-	-	----	----	----
Sample weight (dry)	----	0.01	g	154	154	----	----	----
APPROVED IDENTIFIER:	----	-	--	C.OWLER	C.OWLER	----	----	----
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	----
Arsenic	7440-38-2	5	mg/kg	9	17	6	19	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	----
Chromium	7440-47-3	2	mg/kg	10	5	<2	24	----
Copper	7440-50-8	5	mg/kg	21	24	<5	23	----
Lead	7439-92-1	5	mg/kg	23	16	12	21	----
Nickel	7440-02-0	2	mg/kg	11	13	3	80	----
Zinc	7440-66-6	5	mg/kg	31	47	7	136	----
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ME_MW02_0.5	MK_SB61_0.4	MB_MW03_3.0	MB_MW04_3.5	----
				14-NOV-2013 15:00	14-NOV-2013 15:00	18-NOV-2013 15:00	18-NOV-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1325218-003	ES1325218-005	ES1325218-006	ES1325218-009	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	----
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	----
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<b>100</b>	<100	<100	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<b>100</b>	<50	<50	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	----





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ME_MW02_0.5	MK_SB61_0.4	MB_MW03_3.0	MB_MW04_3.5	----
				14-NOV-2013 15:00	14-NOV-2013 15:00	18-NOV-2013 15:00	18-NOV-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1325218-003	ES1325218-005	ES1325218-006	ES1325218-009	----
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	98.9	99.5	99.5	112	----
2-Chlorophenol-D4	93951-73-6	0.1	%	95.2	98.9	102	113	----
2,4,6-Tribromophenol	118-79-6	0.1	%	82.9	83.0	82.7	96.9	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	93.9	96.5	92.6	106	----
Anthracene-d10	1719-06-8	0.1	%	86.2	84.0	85.7	97.8	----
4-Terphenyl-d14	1718-51-0	0.1	%	81.2	81.0	80.7	98.0	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	89.8	100	99.4	104	----
Toluene-D8	2037-26-5	0.1	%	109	113	104	111	----
4-Bromofluorobenzene	460-00-4	0.1	%	108	104	101	106	----

## Analytical Results

### Descriptive Results

Sub-Matrix: SOIL

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>		
EA200: Description	ME_MW02_0.5 - 14-NOV-2013 15:00	Pale brown clay soil with some grey rocks plus a trace of vegetation
EA200: Description	MK_SB61_0.4 - 14-NOV-2013 15:00	Mid grey soil with some grey rocks plus some brick and slag grains plus a trace of vegetation



## Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

## QUALITY CONTROL REPORT

<b>Work Order</b>	: <b>ES1325218</b>	Page	: 1 of 11
<b>Client</b>	: <b>ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: MR JONATHAN LEKAWSKI	<b>Contact</b>	: Barbara Hanna
<b>Address</b>	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
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<b>Project</b>	: PROJECT SYMPHONY - MP	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b>	: ----	<b>Date Samples Received</b>	: 20-NOV-2013
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: 02-DEC-2013
<b>Sampler</b>	: TS, GP	<b>No. of samples received</b>	: 10
<b>Order number</b>	: 0207423	<b>No. of samples analysed</b>	: 4
<b>Quote number</b>	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

### *Signatories*

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

#### *Signatories*

Christopher Owler  
Pabi Subba  
Pabi Subba  
Raymond Commodor

#### *Position*

Team Leader - Asbestos  
Senior Organic Chemist  
Senior Organic Chemist  
Instrument Chemist

#### *Accreditation Category*

Newcastle - Asbestos  
Sydney Inorganics  
Sydney Organics  
Sydney Inorganics



### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :  
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
RPD = Relative Percentage Difference  
# = Indicates failed QC



## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EA055: Moisture Content (QC Lot: 3176624)</b>									
ES1325206-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	14.3	14.5	1.7	0% - 50%
ES1325206-030	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	9.2	7.6	19.5	No Limit
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3179281)</b>									
ES1325114-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	10	8	31.6	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	7	6	21.3	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.0	No Limit
ES1325279-005	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	72	78	7.5	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	67	62	9.1	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	26	32	19.8	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	49	46	5.6	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	222	157	# 34.4	0% - 20%
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3179282)</b>									
ES1325114-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3173799)</b>									
ES1325206-005	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
		ES1325218-009	MB_MW04_3.5	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5
EP075(SIM): 2-Chlorophenol	95-57-8			0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3173799) - continued</b>									
ES1325218-009	MB_MW04_3.5	EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit		
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3173799)</b>									
ES1325206-005	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
ES1325218-009	MB_MW04_3.5	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3173799) - continued</b>										
ES1325218-009	MB_MW04_3.5	EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3173658)</b>										
ES1325068-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit	
ES1325068-012	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3173798)</b>										
ES1325206-005	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit	
ES1325218-009	MB_MW04_3.5	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3173658)</b>										
ES1325068-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit	
ES1325068-012	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3173798)</b>										
ES1325206-005	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit	
ES1325218-009	MB_MW04_3.5	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit	
<b>EP080: BTEXN (QC Lot: 3173658)</b>										
ES1325068-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
ES1325068-012	Anonymous	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit	
		EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	

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 Work Order : ES1325218  
 Client : ENVIRO RESOURCES MANAGEMENT  
 Project : PROJECT SYMPHONY - MP



Sub-Matrix: <b>SOIL</b>				<i>Laboratory Duplicate (DUP) Report</i>					
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>LOR</i>	<i>Unit</i>	<i>Original Result</i>	<i>Duplicate Result</i>	<i>RPD (%)</i>	<i>Recovery Limits (%)</i>
<b>EP080: BTEXN (QC Lot: 3173658) - continued</b>									
ES1325068-012	Anonymous	EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit





### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3179281)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	112	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	103	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	118	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	111	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	108	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	115	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	114	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	122	81	133	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3179282)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	87.9	66	112	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3173799)</b>									
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	107	74	116	
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	96.0	74	116	
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	95.5	72	116	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	98.8	69	123	
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	80.9	60.3	117	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	93.2	69	117	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	88.1	68	112	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	92.9	73	117	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	85.1	76.4	114	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	81.9	57	111	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	86.7	68.9	112	
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	42.9	3.9	57	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3173799)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	103	80	124	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	102	77	123	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	104	79	123	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	103	77	123	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	107	79	123	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	107	79	123	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	107	79	123	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	109	79	125	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	97.8	73	121	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	103	81	123	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3173799) - continued</b>									
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	96.8	70	118	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	103	77	123	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	103	76	122	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	93.0	71	113	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	89.8	71.7	113	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	91.8	72.4	114	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3173658)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	104	68.4	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3173798)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	96.7	71	131	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	96.6	74	138	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	83.4	64	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3173658)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	102	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3173798)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	97.3	70	130	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	91.8	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	
		50	mg/kg	----	150 mg/kg	69.9	63	131	
<b>EP080: BTEXN (QCLot: 3173658)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	86.2	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	94.0	62	128	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	97.7	58	118	
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	96.2	60	120	
	106-42-3								
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	99.8	60	120	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	84.1	62	138	

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report				
				Spike Concentration	Spike Recovery(%)		Recovery Limits (%)	
					MS	Low	High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3179281)</b>								
ES1325114-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	106	70	130	
		EG005T: Cadmium	7440-43-9	50 mg/kg	101	70	130	



Sub-Matrix: SOIL

				Matrix Spike (MS) Report				
				Spike	SpikeRecovery(%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3179281) - continued</b>								
ES1325114-001	Anonymous	EG005T: Chromium	7440-47-3	50 mg/kg	100	70	130	
		EG005T: Copper	7440-50-8	125 mg/kg	108	70	130	
		EG005T: Lead	7439-92-1	125 mg/kg	100	70	130	
		EG005T: Nickel	7440-02-0	50 mg/kg	104	70	130	
		EG005T: Selenium	7782-49-2	50 mg/kg	105	70	130	
		EG005T: Zinc	7440-66-6	125 mg/kg	115	70	130	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3179282)</b>								
ES1325114-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	94.5	70	130	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3173799)</b>								
ES1325206-005	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	97.0	70	130	
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	92.4	70	130	
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	71.4	60	130	
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	89.9	70	130	
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	49.9	20	130	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3173799)</b>								
ES1325206-005	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	99.4	70	130	
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	104	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3173658)</b>								
ES1325068-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	104	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3173798)</b>								
ES1325206-005	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	83.3	73	137	
		EP071: C15 - C28 Fraction	----	3140 mg/kg	79.4	53	131	
		EP071: C29 - C36 Fraction	----	2860 mg/kg	67.2	52	132	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3173658)</b>								
ES1325068-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	105	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3173798)</b>								
ES1325206-005	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	102	73	137	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	72.0	53	131	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	52.4	52	132	
<b>EP080: BTEXN (QCLot: 3173658)</b>								
ES1325068-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	104	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	108	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	112	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	109	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	111	70	130	
EP080: Naphthalene	91-20-3	2.5 mg/kg	96.0	70	130			



### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
					MS	MSD	Low	High	Value	Control Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3173658)</b>											
ES1325068-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	104	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3173658)</b>											
ES1325068-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	105	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3173658)</b>											
ES1325068-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	104	----	70	130	----	----	
		EP080: Toluene	108-88-3	2.5 mg/kg	108	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	112	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	109	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	111	----	70	130	----	----	
		EP080: Naphthalene	91-20-3	2.5 mg/kg	96.0	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3173798)</b>											
ES1325206-005	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	83.3	----	73	137	----	----	
		EP071: C15 - C28 Fraction	----	3140 mg/kg	79.4	----	53	131	----	----	
		EP071: C29 - C36 Fraction	----	2860 mg/kg	67.2	----	52	132	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3173798)</b>											
ES1325206-005	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	102	----	73	137	----	----	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	72.0	----	53	131	----	----	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	52.4	----	52	132	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3173799)</b>											
ES1325206-005	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	97.0	----	70	130	----	----	
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	92.4	----	70	130	----	----	
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	71.4	----	60	130	----	----	
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	89.9	----	70	130	----	----	
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	49.9	----	20	130	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3173799)</b>											
ES1325206-005	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	99.4	----	70	130	----	----	
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	104	----	70	130	----	----	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3179281)</b>											
ES1325114-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	106	----	70	130	----	----	
		EG005T: Cadmium	7440-43-9	50 mg/kg	101	----	70	130	----	----	
		EG005T: Chromium	7440-47-3	50 mg/kg	100	----	70	130	----	----	
		EG005T: Copper	7440-50-8	125 mg/kg	108	----	70	130	----	----	



Sub-Matrix: **SOIL**

				<i>Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report</i>						
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>Spike</i>	<i>Spike Recovery (%)</i>		<i>Recovery Limits (%)</i>		<i>RPDs (%)</i>	
				<i>Concentration</i>	<i>MS</i>	<i>MSD</i>	<i>Low</i>	<i>High</i>	<i>Value</i>	<i>Control Limit</i>
<b>EG005T: Total Metals by ICP-AES (QCLot: 3179281) - continued</b>										
ES1325114-001	Anonymous	EG005T: Lead	7439-92-1	125 mg/kg	100	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	104	----	70	130	----	----
		EG005T: Selenium	7782-49-2	50 mg/kg	105	----	70	130	----	----
		EG005T: Zinc	7440-66-6	125 mg/kg	115	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3179282)</b>										
ES1325114-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	94.5	----	70	130	----	----

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1325218</b>	Page	: 1 of 6
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: PROJECT SYMPHONY - MP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 20-NOV-2013
C-O-C number	: ----	Issue Date	: 02-DEC-2013
Sampler	: TS, GP	No. of samples received	: 10
Order number	: 0207423	No. of samples analysed	: 4
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EA055: Moisture Content</b>							
Soil Glass Jar - Unpreserved (EA055-103) ME_MW02_0.5, MK_SB61_0.4	14-NOV-2013	----	----	----	25-NOV-2013	28-NOV-2013	✓
Soil Glass Jar - Unpreserved (EA055-103) MB_MW03_3.0, MB_MW04_3.5	18-NOV-2013	----	----	----	25-NOV-2013	02-DEC-2013	✓
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>							
Snap Lock Bag (EA200) ME_MW02_0.5, MK_SB61_0.4	14-NOV-2013	---	13-MAY-2014	----	02-DEC-2013	31-MAY-2014	✓
<b>EG005T: Total Metals by ICP-AES</b>							
Soil Glass Jar - Unpreserved (EG005T) ME_MW02_0.5, MK_SB61_0.4	14-NOV-2013	26-NOV-2013	13-MAY-2014	✓	27-NOV-2013	13-MAY-2014	✓
Soil Glass Jar - Unpreserved (EG005T) MB_MW03_3.0, MB_MW04_3.5	18-NOV-2013	26-NOV-2013	17-MAY-2014	✓	27-NOV-2013	17-MAY-2014	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>							
Soil Glass Jar - Unpreserved (EG035T) ME_MW02_0.5, MK_SB61_0.4	14-NOV-2013	26-NOV-2013	12-DEC-2013	✓	27-NOV-2013	12-DEC-2013	✓
Soil Glass Jar - Unpreserved (EG035T) MB_MW03_3.0, MB_MW04_3.5	18-NOV-2013	26-NOV-2013	16-DEC-2013	✓	27-NOV-2013	16-DEC-2013	✓
<b>EP080/071: Total Petroleum Hydrocarbons</b>							
Soil Glass Jar - Unpreserved (EP071) ME_MW02_0.5, MK_SB61_0.4	14-NOV-2013	25-NOV-2013	28-NOV-2013	✓	26-NOV-2013	04-JAN-2014	✓
Soil Glass Jar - Unpreserved (EP071) MB_MW03_3.0, MB_MW04_3.5	18-NOV-2013	25-NOV-2013	02-DEC-2013	✓	26-NOV-2013	04-JAN-2014	✓
<b>EP075(SIM)A: Phenolic Compounds</b>							
Soil Glass Jar - Unpreserved (EP075(SIM)) ME_MW02_0.5, MK_SB61_0.4	14-NOV-2013	25-NOV-2013	28-NOV-2013	✓	25-NOV-2013	04-JAN-2014	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) MB_MW03_3.0, MB_MW04_3.5	18-NOV-2013	25-NOV-2013	02-DEC-2013	✓	25-NOV-2013	04-JAN-2014	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>							
Soil Glass Jar - Unpreserved (EP075(SIM)) ME_MW02_0.5, MK_SB61_0.4	14-NOV-2013	25-NOV-2013	28-NOV-2013	✓	25-NOV-2013	04-JAN-2014	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) MB_MW03_3.0, MB_MW04_3.5	18-NOV-2013	25-NOV-2013	02-DEC-2013	✓	25-NOV-2013	04-JAN-2014	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP080: BTEXN</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b> ME_MW02_0.5, MK_SB61_0.4	14-NOV-2013	22-NOV-2013	28-NOV-2013	✓	23-NOV-2013	28-NOV-2013	✓	
<b>Soil Glass Jar - Unpreserved (EP080)</b> MB_MW03_3.0, MB_MW04_3.5	18-NOV-2013	22-NOV-2013	02-DEC-2013	✓	23-NOV-2013	02-DEC-2013	✓	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b> ME_MW02_0.5, MK_SB61_0.4	14-NOV-2013	22-NOV-2013	28-NOV-2013	✓	23-NOV-2013	28-NOV-2013	✓	
<b>Soil Glass Jar - Unpreserved (EP080)</b> MB_MW03_3.0, MB_MW04_3.5	18-NOV-2013	22-NOV-2013	02-DEC-2013	✓	23-NOV-2013	02-DEC-2013	✓	





## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Moisture Content	EA055-103	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	11	18.2	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	7	14.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	7	14.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	7	14.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	7	14.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Asbestos Identification in bulk solids	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (2013) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.



## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Duplicate (DUP) RPDs</b>							
EG005T: Total Metals by ICP-AES	ES1325279-005	Anonymous	Zinc	7440-66-6	34.4 %	0-20%	RPD exceeds LOR based limits

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Laboratory Control outliers occur.
- For all matrices, no Matrix Spike outliers occur.

### Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- No Analysis Holding Time Outliers exist.

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

<b>Work Order : ES1325218</b>	
<b>Client : ENVIRO RESOURCES MANAGEMENT</b> <b>Contact : MR JONATHAN LEKAWSKI</b> <b>Address : GROUND FLOOR</b> 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Laboratory : Environmental Division Sydney</b>  <b>Contact : Barbara Hanna</b> <b>Address : 277-289 Woodpark Road Smithfield</b> NSW Australia 2164
<b>E-mail : jonathan.lekawski@erm.com</b> <b>Telephone : +61 02 8584 8888</b> <b>Facsimile : +61 02 8584 8800</b>	<b>E-mail : Barbara.Hanna@alsglobal.com</b> <b>Telephone : +61 2 8784 8555</b> <b>Facsimile : +61 2 8784 8555</b>
<b>Project : PROJECT SYMPHONY - MP</b> <b>Order number : 0207423</b> <b>C-O-C number : ----</b> <b>Site : ----</b> <b>Sampler : TS, GP</b>	<b>Page : 1 of 2</b>  <b>Quote number : ES2013ENVRES0370 (SY/278/13 V3)</b>  <b>QC Level : NEPM 2013 Schedule B(3) and ALS QCS3 requirement</b>

#### Dates

<b>Date Samples Received : 20-NOV-2013</b> <b>Client Requested Due Date : 27-NOV-2013</b>	<b>Issue Date : 20-NOV-2013 20:37</b> <b>Scheduled Reporting Date : 27-NOV-2013</b>
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#### Delivery Details

<b>Mode of Delivery : Carrier</b> <b>No. of coolers/boxes : 2 HARD</b> <b>Security Seal : Intact.</b>	<b>Temperature : 10°C - Ice present</b> <b>No. of samples received : 10</b> <b>No. of samples analysed : 4</b>
---	--

#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Asbestos analysis will be conducted by ALS Newcastle.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA200 Asbestos Identification in Soils	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - S-27 TRH/TEXN/PAH/Phenols&Metals
ES1325218-001	14-NOV-2013 15:00	ME_MW02_0.15	✓			
ES1325218-002	14-NOV-2013 15:00	ME_MW02_1.0	✓			
ES1325218-003	14-NOV-2013 15:00	ME_MW02_0.5		✓	✓	✓
ES1325218-004	14-NOV-2013 15:00	MK_SB61_0.15	✓			
ES1325218-005	14-NOV-2013 15:00	MK_SB61_0.4		✓	✓	✓
ES1325218-006	18-NOV-2013 15:00	MB_MW03_3.0			✓	✓
ES1325218-007	18-NOV-2013 15:00	MB_MW03_4.5	✓			
ES1325218-008	18-NOV-2013 15:00	MB_MW03_7.8	✓			
ES1325218-009	18-NOV-2013 15:00	MB_MW04_3.5			✓	✓
ES1325218-010	18-NOV-2013 15:00	MB_MW04_7.5	✓			

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
 Email jonathan.lekawski@erm.com  
 Email jonathan.lekawski@erm.com  
 Email jonathan.lekawski@erm.com  
 Email jonathan.lekawski@erm.com  
 Email jonathan.lekawski@erm.com  
 Email jonathan.lekawski@erm.com  
 Email jonathan.lekawski@erm.com  
 Email jonathan.lekawski@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email symphony.deltawest@erm.com  
 Email symphony.deltawest@erm.com  
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 Email symphony.deltawest@erm.com  
 Email symphony.deltawest@erm.com  
 Email symphony.deltawest@erm.com  
 Email symphony.deltawest@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com



## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>ES1325219</b> <b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : MR JONATHAN LEKAWSKI <b>Address</b> : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007  <b>E-mail</b> : jonathan.lekawski@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800 <b>Project</b> : 0207423 SYMPHONY - MT PIPER <b>Order number</b> : ---- <b>C-O-C number</b> : 11735 <b>Sampler</b> : GP <b>Site</b> : MT. PIPER  <b>Quote number</b> : SY/278/13 V3	<b>Page</b> : 1 of 7  <b>Laboratory</b> : Environmental Division Sydney <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164  <b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555 <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement  <b>Date Samples Received</b> : 20-NOV-2013 <b>Issue Date</b> : 27-NOV-2013  <b>No. of samples received</b> : 11 <b>No. of samples analysed</b> : 6
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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Pabi Subba	Senior Organic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Raymond Commodor	Instrument Chemist	Sydney Inorganics



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EP080: Surrogate recovery bias low due to sample matrix interferences, confirmed by re-extraction and re-analysis.**
- **EP080: The TRIP SPIKE and TRIP SPIKE CONTROL have been analysed for volatile TPH and BTEX only. The TRIP SPIKE and TRIP SPIKE CONTROL were prepared in the lab using reagent grade sand spiked with petrol. The TRIP SPIKE was dispatched from the lab and the TRIP SPIKE CONTROL retained. The spike samples were extracted and analysed concurrently with samples reported in this batch.**





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MH_MW03_18.0	MH_MW01_8.0	MH_MW01_26.0	TRIP SPIKE	TRIP BLANK
				14-NOV-2013 15:00	18-NOV-2013 15:00	18-NOV-2013 15:00	13-NOV-2013 15:00	18-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325219-001	ES1325219-005	ES1325219-006	ES1325219-009	ES1325219-010
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	13.9	19.7	12.8	----	----
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	----	----
Arsenic	7440-38-2	5	mg/kg	14	<5	<5	----	----
Cadmium	7440-43-9	1	mg/kg	2	<1	<1	----	----
Chromium	7440-47-3	2	mg/kg	81	5	110	----	----
Copper	7440-50-8	5	mg/kg	23	13	10	----	----
Lead	7439-92-1	5	mg/kg	22	15	14	----	----
Nickel	7440-02-0	2	mg/kg	51	5	11	----	----
Zinc	7440-66-6	5	mg/kg	76	30	48	----	----
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	----	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	0.7	<0.5	<0.5	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Phenanthrene	85-01-8	0.5	mg/kg	0.8	2.3	0.7	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	1.3	<0.5	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				MH_MW03_18.0	MH_MW01_8.0	MH_MW01_26.0	TRIP SPIKE	TRIP BLANK
				14-NOV-2013 15:00	18-NOV-2013 15:00	18-NOV-2013 15:00	13-NOV-2013 15:00	18-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325219-001	ES1325219-005	ES1325219-006	ES1325219-009	ES1325219-010
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Pyrene	129-00-0	0.5	mg/kg	<0.5	1.1	<0.5	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	0.7	<0.5	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	1.0	<0.5	----	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	0.6	<0.5	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	1.5	7.0	0.7	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.7	0.6	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	1.2	----	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	72	<10
C10 - C14 Fraction	----	50	mg/kg	<50	60	<50	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	450	120	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	220	<100	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	730	120	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	82	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	46	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	100	<50	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	560	150	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	120	<100	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	780	150	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	100	<50	----	----
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	0.6	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	19.0	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	2.1	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	10.4	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MH_MW03_18.0	MH_MW01_8.0	MH_MW01_26.0	TRIP SPIKE	TRIP BLANK
				14-NOV-2013 15:00	18-NOV-2013 15:00	18-NOV-2013 15:00	13-NOV-2013 15:00	18-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325219-001	ES1325219-005	ES1325219-006	ES1325219-009	ES1325219-010
<b>EP080: BTEXN - Continued</b>								
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	4.2	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	36.3	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	14.6	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	106	95.1	96.6	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	111	93.2	98.0	----	----
2,4,6-Tribromophenol	118-79-6	0.1	%	89.1	76.7	80.7	----	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	103	93.7	91.8	----	----
Anthracene-d10	1719-06-8	0.1	%	92.2	79.7	80.5	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	86.4	77.0	75.9	----	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	88.8	76.4	84.8	84.6	77.6
Toluene-D8	2037-26-5	0.1	%	84.4	77.1	78.6	83.6	74.4
4-Bromofluorobenzene	460-00-4	0.1	%	82.0	61.7	74.7	80.6	73.6



## Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)

Client sample ID

				<b>TSC</b>	---	---	---	---
				13-NOV-2013 15:00	---	---	---	---
				<b>ES1325219-011</b>	---	---	---	---
<i>Compound</i>	<i>CAS Number</i>	<i>LOR</i>	<i>Unit</i>					
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
<b>C6 - C9 Fraction</b>	---	10	mg/kg	<b>89</b>	---	---	---	---
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
<b>C6 - C10 Fraction</b>	C6_C10	10	mg/kg	<b>99</b>	---	---	---	---
<b>C6 - C10 Fraction minus BTEX (F1)</b>	C6_C10-BTEX	10	mg/kg	<b>58</b>	---	---	---	---
<b>EP080: BTEXN</b>								
<b>Benzene</b>	71-43-2	0.2	mg/kg	<b>0.8</b>	---	---	---	---
<b>Toluene</b>	108-88-3	0.5	mg/kg	<b>21.5</b>	---	---	---	---
<b>Ethylbenzene</b>	100-41-4	0.5	mg/kg	<b>2.4</b>	---	---	---	---
<b>meta- &amp; para-Xylene</b>	108-38-3 106-42-3	0.5	mg/kg	<b>11.6</b>	---	---	---	---
<b>ortho-Xylene</b>	95-47-6	0.5	mg/kg	<b>4.6</b>	---	---	---	---
<b>Sum of BTEX</b>	---	0.2	mg/kg	<b>40.9</b>	---	---	---	---
<b>Total Xylenes</b>	1330-20-7	0.5	mg/kg	<b>16.2</b>	---	---	---	---
<b>Naphthalene</b>	91-20-3	1	mg/kg	<b>&lt;1</b>	---	---	---	---
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
<b>1,2-Dichloroethane-D4</b>	17060-07-0	0.1	%	<b>89.0</b>	---	---	---	---
<b>Toluene-D8</b>	2037-26-5	0.1	%	<b>95.0</b>	---	---	---	---
<b>4-Bromofluorobenzene</b>	460-00-4	0.1	%	<b>94.6</b>	---	---	---	---



## Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP075(SIM): Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
<b>EP075(SIM): PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: ES1325219</b>	<b>Page</b>	<b>: 1 of 11</b>
<b>Client</b>	<b>: ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	<b>: Environmental Division Sydney</b>
<b>Contact</b>	<b>: MR JONATHAN LEKAWSKI</b>	<b>Contact</b>	<b>: Barbara Hanna</b>
<b>Address</b>	<b>: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007</b>	<b>Address</b>	<b>: 277-289 Woodpark Road Smithfield NSW Australia 2164</b>
<b>E-mail</b>	<b>: jonathan.lekawski@erm.com</b>	<b>E-mail</b>	<b>: Barbara.Hanna@alsglobal.com</b>
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<b>Facsimile</b>	<b>: +61 02 8584 8800</b>	<b>Facsimile</b>	<b>: +61 2 8784 8555</b>
<b>Project</b>	<b>: 0207423 SYMPHONY - MT PIPER</b>	<b>QC Level</b>	<b>: NEPM 2013 Schedule B(3) and ALS QCS3 requirement</b>
<b>Site</b>	<b>: MT. PIPER</b>	<b>Date Samples Received</b>	<b>: 20-NOV-2013</b>
<b>C-O-C number</b>	<b>: 11735</b>	<b>Issue Date</b>	<b>: 27-NOV-2013</b>
<b>Sampler</b>	<b>: GP</b>	<b>No. of samples received</b>	<b>: 11</b>
<b>Order number</b>	<b>: ----</b>	<b>No. of samples analysed</b>	<b>: 6</b>
<b>Quote number</b>	<b>: SY/278/13 V3</b>		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Pabi Subba	Senior Organic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Raymond Commodor	Instrument Chemist	Sydney Inorganics



### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :            Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
                  CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
                  LOR = Limit of reporting  
                  RPD = Relative Percentage Difference  
                  # = Indicates failed QC



## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EA055: Moisture Content (QC Lot: 3176624)</b>									
ES1325206-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	14.3	14.5	1.7	0% - 50%
ES1325206-030	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	9.2	7.6	19.5	No Limit
<b>EA055: Moisture Content (QC Lot: 3176625)</b>									
ES1325220-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	13.5	12.6	6.7	0% - 50%
ES1325220-012	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	20.1	19.7	2.1	0% - 20%
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3178433)</b>									
EB1328297-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	1	1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	6	6	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	5	6	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	7	19.3	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	6	7	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	10	16	43.6	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	26	29	11.6	No Limit
ES1325206-012	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	1	1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	17	15	13.4	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	6	8	19.1	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	7	6	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	13	13	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	17	12	33.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	19	18	0.0	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3178434)</b>									
EB1328297-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1325206-012	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3173799)</b>									
ES1325206-005	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit





Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3173799) - continued</b>									
ES1325206-005	Anonymous	EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
ES1325218-009	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3173799)</b>									
ES1325206-005	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1,2,3-cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1325218-009	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3173799) - continued</b>									
ES1325218-009	Anonymous	EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3173738)</b>									
ES1325206-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1325206-045	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3173798)</b>									
ES1325206-005	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1325218-009	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3173738)</b>									
ES1325206-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES1325206-045	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3173798)</b>									
ES1325206-005	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
ES1325218-009	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3173738)</b>									
ES1325206-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						

Page : 6 of 11  
 Work Order : ES1325219  
 Client : ENVIRO RESOURCES MANAGEMENT  
 Project : 0207423 SYMPHONY - MT PIPER



Sub-Matrix: <b>SOIL</b>				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
<b>EP080: BTEXN (QC Lot: 3173738) - continued</b>										
ES1325206-001	Anonymous	EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit	
ES1325206-045	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit		



### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3178433)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	104	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	102	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	97.5	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	99.9	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	98.1	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	103	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	110	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	97.5	81	133	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3178434)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	84.5	66	112	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3173799)</b>									
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	107	74	116	
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	96.0	74	116	
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	95.5	72	116	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	98.8	69	123	
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	80.9	60.3	117	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	93.2	69	117	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	88.1	68	112	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	92.9	73	117	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	85.1	76.4	114	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	81.9	57	111	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	86.7	68.9	112	
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	42.9	3.9	57	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3173799)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	103	80	124	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	102	77	123	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	104	79	123	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	103	77	123	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	107	79	123	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	107	79	123	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	107	79	123	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	109	79	125	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	97.8	73	121	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	103	81	123	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3173799) - continued</b>									
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	96.8	70	118	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	103	77	123	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	103	76	122	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	93.0	71	113	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	89.8	71.7	113	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	91.8	72.4	114	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3173738)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	72.4	68.4	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3173798)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	96.7	71	131	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	96.6	74	138	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	83.4	64	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3173738)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	71.8	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3173798)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	97.3	70	130	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	91.8	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	
		50	mg/kg	----	150 mg/kg	69.9	63	131	
<b>EP080: BTEXN (QCLot: 3173738)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	76.1	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	75.7	62	128	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	74.7	58	118	
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	71.7	60	120	
	106-42-3								
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	76.4	60	120	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	70.3	62	138	

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report				
				Spike Concentration	Spike Recovery(%)		Recovery Limits (%)	
					MS	Low	High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3178433)</b>								
EB1328297-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	96.5	70	130	
		EG005T: Cadmium	7440-43-9	50 mg/kg	92.2	70	130	



Sub-Matrix: SOIL

				Matrix Spike (MS) Report				
				Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3178433) - continued</b>								
EB1328297-001	Anonymous	EG005T: Chromium	7440-47-3	50 mg/kg	94.7	70	130	
		EG005T: Copper	7440-50-8	125 mg/kg	100	70	130	
		EG005T: Lead	7439-92-1	125 mg/kg	93.6	70	130	
		EG005T: Nickel	7440-02-0	50 mg/kg	95.4	70	130	
		EG005T: Selenium	7782-49-2	50 mg/kg	107	70	130	
		EG005T: Zinc	7440-66-6	125 mg/kg	91.9	70	130	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3178434)</b>								
EB1328297-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	96.2	70	130	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3173799)</b>								
ES1325206-005	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	97.0	70	130	
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	92.4	70	130	
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	71.4	60	130	
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	89.9	70	130	
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	49.9	20	130	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3173799)</b>								
ES1325206-005	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	99.4	70	130	
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	104	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3173738)</b>								
ES1325206-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	85.1	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3173798)</b>								
ES1325206-005	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	83.3	73	137	
		EP071: C15 - C28 Fraction	----	3140 mg/kg	79.4	53	131	
		EP071: C29 - C36 Fraction	----	2860 mg/kg	67.2	52	132	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3173738)</b>								
ES1325206-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	83.0	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3173798)</b>								
ES1325206-005	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	102	73	137	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	72.0	53	131	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	52.4	52	132	
<b>EP080: BTEXN (QCLot: 3173738)</b>								
ES1325206-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	77.8	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	79.8	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	77.3	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	76.9	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	78.9	70	130	
EP080: Naphthalene	91-20-3	2.5 mg/kg	76.9	70	130			



### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
					MS	MSD	Low	High	Value	Control Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3173738)</b>											
ES1325206-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	85.1	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3173738)</b>											
ES1325206-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	83.0	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3173738)</b>											
ES1325206-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	77.8	----	70	130	----	----	
		EP080: Toluene	108-88-3	2.5 mg/kg	79.8	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	77.3	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	76.9	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	78.9	----	70	130	----	----	
		EP080: Naphthalene	91-20-3	2.5 mg/kg	76.9	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3173798)</b>											
ES1325206-005	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	83.3	----	73	137	----	----	
		EP071: C15 - C28 Fraction	----	3140 mg/kg	79.4	----	53	131	----	----	
		EP071: C29 - C36 Fraction	----	2860 mg/kg	67.2	----	52	132	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3173798)</b>											
ES1325206-005	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	102	----	73	137	----	----	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	72.0	----	53	131	----	----	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	52.4	----	52	132	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3173799)</b>											
ES1325206-005	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	97.0	----	70	130	----	----	
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	92.4	----	70	130	----	----	
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	71.4	----	60	130	----	----	
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	89.9	----	70	130	----	----	
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	49.9	----	20	130	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3173799)</b>											
ES1325206-005	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	99.4	----	70	130	----	----	
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	104	----	70	130	----	----	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3178433)</b>											
EB1328297-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	96.5	----	70	130	----	----	
		EG005T: Cadmium	7440-43-9	50 mg/kg	92.2	----	70	130	----	----	
		EG005T: Chromium	7440-47-3	50 mg/kg	94.7	----	70	130	----	----	
		EG005T: Copper	7440-50-8	125 mg/kg	100	----	70	130	----	----	



Sub-Matrix: **SOIL**

				<i>Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report</i>						
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>Spike</i>	<i>Spike Recovery (%)</i>		<i>Recovery Limits (%)</i>		<i>RPDs (%)</i>	
				<i>Concentration</i>	<i>MS</i>	<i>MSD</i>	<i>Low</i>	<i>High</i>	<i>Value</i>	<i>Control Limit</i>
<b>EG005T: Total Metals by ICP-AES (QCLot: 3178433) - continued</b>										
EB1328297-001	Anonymous	EG005T: Lead	7439-92-1	125 mg/kg	93.6	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	95.4	----	70	130	----	----
		EG005T: Selenium	7782-49-2	50 mg/kg	107	----	70	130	----	----
		EG005T: Zinc	7440-66-6	125 mg/kg	91.9	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3178434)</b>										
EB1328297-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	96.2	----	70	130	----	----



## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1325219</b>	Page	: 1 of 6
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: 0207423 SYMPHONY - MT PIPER	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: MT. PIPER	Date Samples Received	: 20-NOV-2013
C-O-C number	: 11735	Issue Date	: 27-NOV-2013
Sampler	: GP	No. of samples received	: 11
Order number	: ----	No. of samples analysed	: 6
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EA055: Moisture Content</b>							
Soil Glass Jar - Unpreserved (EA055-103) MH_MW03_18.0	14-NOV-2013	----	----	----	25-NOV-2013	28-NOV-2013	✓
Soil Glass Jar - Unpreserved (EA055-103) MH_MW01_8.0, MH_MW01_26.0	18-NOV-2013	----	----	----	25-NOV-2013	02-DEC-2013	✓
<b>EG005T: Total Metals by ICP-AES</b>							
Soil Glass Jar - Unpreserved (EG005T) MH_MW03_18.0	14-NOV-2013	26-NOV-2013	13-MAY-2014	✓	26-NOV-2013	13-MAY-2014	✓
Soil Glass Jar - Unpreserved (EG005T) MH_MW01_8.0, MH_MW01_26.0	18-NOV-2013	26-NOV-2013	17-MAY-2014	✓	26-NOV-2013	17-MAY-2014	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>							
Soil Glass Jar - Unpreserved (EG035T) MH_MW03_18.0	14-NOV-2013	26-NOV-2013	12-DEC-2013	✓	27-NOV-2013	12-DEC-2013	✓
Soil Glass Jar - Unpreserved (EG035T) MH_MW01_8.0, MH_MW01_26.0	18-NOV-2013	26-NOV-2013	16-DEC-2013	✓	27-NOV-2013	16-DEC-2013	✓
<b>EP080/071: Total Petroleum Hydrocarbons</b>							
Soil Glass Jar - Unpreserved (EP071) MH_MW03_18.0	14-NOV-2013	25-NOV-2013	28-NOV-2013	✓	26-NOV-2013	04-JAN-2014	✓
Soil Glass Jar - Unpreserved (EP071) MH_MW01_8.0, MH_MW01_26.0	18-NOV-2013	25-NOV-2013	02-DEC-2013	✓	26-NOV-2013	04-JAN-2014	✓
<b>EP075(SIM)A: Phenolic Compounds</b>							
Soil Glass Jar - Unpreserved (EP075(SIM)) MH_MW03_18.0	14-NOV-2013	25-NOV-2013	28-NOV-2013	✓	25-NOV-2013	04-JAN-2014	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) MH_MW01_8.0, MH_MW01_26.0	18-NOV-2013	25-NOV-2013	02-DEC-2013	✓	25-NOV-2013	04-JAN-2014	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>							
Soil Glass Jar - Unpreserved (EP075(SIM)) MH_MW03_18.0	14-NOV-2013	25-NOV-2013	28-NOV-2013	✓	25-NOV-2013	04-JAN-2014	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) MH_MW01_8.0, MH_MW01_26.0	18-NOV-2013	25-NOV-2013	02-DEC-2013	✓	25-NOV-2013	04-JAN-2014	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP080: BTEXN</b>							
Soil Glass Jar - Unpreserved (EP080) TRIP SPIKE, TSC	13-NOV-2013	25-NOV-2013	27-NOV-2013	✓	26-NOV-2013	27-NOV-2013	✓
Soil Glass Jar - Unpreserved (EP080) MH_MW03_18.0	14-NOV-2013	25-NOV-2013	28-NOV-2013	✓	26-NOV-2013	28-NOV-2013	✓
Soil Glass Jar - Unpreserved (EP080) MH_MW01_8.0, TRIP BLANK MH_MW01_26.0,	18-NOV-2013	25-NOV-2013	02-DEC-2013	✓	26-NOV-2013	02-DEC-2013	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>							
Soil Glass Jar - Unpreserved (EP080) TRIP SPIKE, TSC	13-NOV-2013	25-NOV-2013	27-NOV-2013	✓	26-NOV-2013	27-NOV-2013	✓
Soil Glass Jar - Unpreserved (EP080) MH_MW03_18.0	14-NOV-2013	25-NOV-2013	28-NOV-2013	✓	26-NOV-2013	28-NOV-2013	✓
Soil Glass Jar - Unpreserved (EP080) MH_MW01_8.0, TRIP BLANK MH_MW01_26.0,	18-NOV-2013	25-NOV-2013	02-DEC-2013	✓	26-NOV-2013	02-DEC-2013	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Moisture Content	EA055-103	4	39	10.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	11	18.2	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (2013) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.



## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.
- For all matrices, no Matrix Spike outliers occur.

#### Regular Sample Surrogates

Sub-Matrix: SOIL

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Samples Submitted</b>							
EP080S: TPH(V)/BTEX Surrogates	ES1325219-005	MH_MW01_8.0	4-Bromofluorobenzene	460-00-4	61.7 %	71.6-130.0 %	Recovery less than lower data quality objective

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- No Analysis Holding Time Outliers exist.

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

<b>Work Order</b>	: <b>ES1325219</b>		
<b>Client</b>	: <b>ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact Address</b>	: MR JONATHAN LEKAWSKI GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Contact Address</b>	: Barbara Hanna 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: jonathan.lekawski@erm.com	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: 0207423 SYMPHONY - MT PIPER	<b>Page</b>	: 1 of 2
<b>Order number</b>	: ----		
<b>C-O-C number</b>	: 11735	<b>Quote number</b>	: ES2013ENVRES0370 (SY/278/13 V3)
<b>Site</b>	: MT. PIPER		
<b>Sampler</b>	: GP	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement

#### Dates

Date Samples Received	: 20-NOV-2013	Issue Date	: 21-NOV-2013 17:07
Client Requested Due Date	: 27-NOV-2013	Scheduled Reporting Date	: <b>27-NOV-2013</b>

#### Delivery Details

Mode of Delivery	: Carrier	Temperature	: 10°C - Ice present
No. of coolers/boxes	: 2 HARD	No. of samples received	: 11
Security Seal	: Intact.	No. of samples analysed	: 6

#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - S-18 (NO MOIST) TRH(C6-C9)/BTEXN with No Moisture for TBs	SOIL - S-27 TRH/BTEXN/PAH/Phenols/8Metals
ES1325219-001	14-NOV-2013 15:00	MH_MW03_18.0		✓		✓
ES1325219-002	18-NOV-2013 15:00	MH_MW01_2.0	✓			
ES1325219-003	18-NOV-2013 15:00	MH_MW01_4.0	✓			
ES1325219-004	18-NOV-2013 15:00	MH_MW01_6.3	✓			
ES1325219-005	18-NOV-2013 15:00	MH_MW01_8.0		✓		✓
ES1325219-006	18-NOV-2013 15:00	MH_MW01_26.0		✓		✓
ES1325219-007	18-NOV-2013 15:00	MH_MW02_1.5	✓			
ES1325219-008	18-NOV-2013 15:00	MH_MW02_4.0	✓			
ES1325219-009	13-NOV-2013 15:00	TRIP SPIKE			✓	
ES1325219-010	18-NOV-2013 15:00	TRIP BLANK			✓	
ES1325219-011	13-NOV-2013 15:00	TSC			✓	

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
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Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email symphony.deltawest@erm.com  
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Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com





## Wanida Roberts

---

**From:** Barbara Hanna  
**Sent:** Thursday, 21 November 2013 5:38 PM  
**To:** Wanida Roberts  
**Subject:** FW: Work order ES1325219

Hi Wanida,

Could you please arrange this ASAP.

Thanks!!!

Kind Regards

**Barbara Hanna**

Client Services Manager  
ALS | Environmental Division

277-289 Woodpark Road  
Smithfield NSW 2164 Australia

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**From:** Gavin Powell [<mailto:Gavin.Powell@erm.com>]  
**Sent:** Thursday, 21 November 2013 4:58 PM  
**To:** Barbara Hanna  
**Cc:** Anne Ashworth  
**Subject:** Work order ES1325219

Hi Barbara,

For ERM work order ES1325219 may I please schedule MH\_MW01\_8.0 for analysis as per MH\_MW01\_26.0.



Thanks,

Gavin

Gavin Powell  
Environmental Scientist  
Environmental Resources Management Australia

53 Bonville Avenue  
Thornton NSW 2322  
PO Box 3071  
Thornton NSW 2322

T: +61 2 49642150  
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[www.erm.com](http://www.erm.com)  
[gavin.powell@erm.com](mailto:gavin.powell@erm.com)

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## CERTIFICATE OF ANALYSIS

Work Order	: <b>ES1325472</b>	Page	: 1 of 14
Client	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: 0207423 SYMPHONY	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 22-NOV-2013
C-O-C number	: 11736	Issue Date	: 03-DEC-2013
Sampler	: GP	No. of samples received	: 14
Site	: MT PIPER	No. of samples analysed	: 10
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EA150H: Soil Particle Density required for Hydrometer analysis according to AS 1289.3.5.1-2006 was not requested by the client. Typical sediment SPD values used for calculations and consequently NATA endorsement does not apply to hydrometer results.**
- **EP080: The TRIP SPIKE and TRIP SPIKE CONTROL have been analysed for volatile TPH and BTEX only. The TRIP SPIKE and TRIP SPIKE CONTROL were prepared in the lab using reagent grade sand spiked with petrol. The TRIP SPIKE was dispatched from the lab and the TRIP SPIKE CONTROL retained. The spike samples were extracted and analysed concurrently with samples reported in this batch.**



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

## Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

### Signatories

### Position

### Accreditation Category

Ashesh Patel	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Hamish Murray	Supervisor - Soils	Newcastle - Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Compound	CAS Number	LOR	Unit	MH_MW02_12.0	MC_MW03_3.6	MC_MW02_2.0	MC_MW02_3.0	MH_MW02_0.2
				19-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00
				ES1325472-002	ES1325472-004	ES1325472-006	ES1325472-007	ES1325472-008
<b>EA150: Particle Sizing</b>								
+75µm	----	1	%	----	----	----	----	64
+150µm	----	1	%	----	----	----	----	55
+300µm	----	1	%	----	----	----	----	48
+425µm	----	1	%	----	----	----	----	46
+600µm	----	1	%	----	----	----	----	44
+1180µm	----	1	%	----	----	----	----	42
+2.36mm	----	1	%	----	----	----	----	39
+4.75mm	----	1	%	----	----	----	----	36
+9.5mm	----	1	%	----	----	----	----	30
+19.0mm	----	1	%	----	----	----	----	30
+37.5mm	----	1	%	----	----	----	----	23
+75.0mm	----	1	%	----	----	----	----	<1
<b>EA002 : pH (Soils)</b>								
pH Value	----	0.1	pH Unit	----	----	----	----	4.8
<b>EA010: Conductivity</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	----	----	----	----	55
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	6.0	13.2	12.8	13.2	----
<b>EA150: Soil Classification based on Particle Size</b>								
Clay (<2 µm)	----	1	%	----	----	----	----	13
Silt (2-60 µm)	----	1	%	----	----	----	----	23
Sand (0.06-2.00 mm)	----	1	%	----	----	----	----	25
Gravel (>2mm)	----	1	%	----	----	----	----	39
Cobbles (>6cm)	----	1	%	----	----	----	----	<1
<b>ED008: Exchangeable Cations</b>								
Exchangeable Calcium	----	0.1	meq/100g	----	----	----	----	3.1
Exchangeable Magnesium	----	0.1	meq/100g	----	----	----	----	0.9
Exchangeable Potassium	----	0.1	meq/100g	----	----	----	----	0.2
Exchangeable Sodium	----	0.1	meq/100g	----	----	----	----	<0.1
Cation Exchange Capacity	----	0.1	meq/100g	----	----	----	----	4.2
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	----
Arsenic	7440-38-2	5	mg/kg	5	15	17	<5	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MH_MW02_12.0	MC_MW03_3.6	MC_MW02_2.0	MC_MW02_3.0	MH_MW02_0.2
				19-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325472-002	ES1325472-004	ES1325472-006	ES1325472-007	ES1325472-008
<b>EG005T: Total Metals by ICP-AES - Continued</b>								
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	----
Chromium	7440-47-3	2	mg/kg	28	17	13	2	----
Copper	7440-50-8	5	mg/kg	13	20	26	8	----
Lead	7439-92-1	5	mg/kg	19	18	20	11	----
Nickel	7440-02-0	2	mg/kg	17	53	48	7	----
Zinc	7440-66-6	5	mg/kg	46	70	68	29	----
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	----
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	0.1	mg/kg	----	<0.1	<0.1	<0.1	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
Isopropylbenzene	98-82-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
n-Propylbenzene	103-65-1	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
n-Butylbenzene	104-51-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	----	<5	<5	<5	----
2-Butanone (MEK)	78-93-3	5	mg/kg	----	<5	<5	<5	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	----	<5	<5	<5	----
2-Hexanone (MBK)	591-78-6	5	mg/kg	----	<5	<5	<5	----
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1,2-Dichloropropane	78-87-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MH_MW02_12.0	MC_MW03_3.6	MC_MW02_2.0	MC_MW02_3.0	MH_MW02_0.2
				19-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325472-002	ES1325472-004	ES1325472-006	ES1325472-007	ES1325472-008
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	----	<5	<5	<5	----
Chloromethane	74-87-3	5	mg/kg	----	<5	<5	<5	----
Vinyl chloride	75-01-4	5	mg/kg	----	<5	<5	<5	----
Bromomethane	74-83-9	5	mg/kg	----	<5	<5	<5	----
Chloroethane	75-00-3	5	mg/kg	----	<5	<5	<5	----
Trichlorofluoromethane	75-69-4	5	mg/kg	----	<5	<5	<5	----
1,1-Dichloroethene	75-35-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
Iodomethane	74-88-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1,1-Dichloroethane	75-34-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1,2-Dichloroethane	107-06-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
Trichloroethene	79-01-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
Dibromomethane	74-95-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1,3-Dichloropropane	142-28-9	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
Tetrachloroethene	127-18-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
Pentachloroethane	76-01-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
Bromobenzene	108-86-1	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
2-Chlorotoluene	95-49-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
4-Chlorotoluene	106-43-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	----	<0.5	<0.5	<0.5	----





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Compound	CAS Number	LOR	Unit	MH_MW02_12.0	MC_MW03_3.6	MC_MW02_2.0	MC_MW02_3.0	MH_MW02_0.2
				19-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00
				ES1325472-002	ES1325472-004	ES1325472-006	ES1325472-007	ES1325472-008
<b>EP074F: Halogenated Aromatic Compounds - Continued</b>								
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
Bromodichloromethane	75-27-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
Dibromochloromethane	124-48-1	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
Bromoform	75-25-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	----
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	5	mg/kg	----	<5	<5	<5	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<b>0.9</b>	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg	<b>2.0</b>	<0.5	<b>0.7</b>	<0.5	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg	<b>1.6</b>	<0.5	<0.5	<0.5	----
Pyrene	129-00-0	0.5	mg/kg	<b>1.4</b>	<0.5	<0.5	<0.5	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MH_MW02_12.0	MC_MW03_3.6	MC_MW02_2.0	MC_MW02_3.0	MH_MW02_0.2
				19-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325472-002	ES1325472-004	ES1325472-006	ES1325472-007	ES1325472-008
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Benz(a)anthracene	56-55-3	0.5	mg/kg	0.8	<0.5	<0.5	<0.5	----
Chrysene	218-01-9	0.5	mg/kg	1.1	<0.5	<0.5	<0.5	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	0.7	<0.5	<0.5	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	0.6	<0.5	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	8.2	<0.5	1.6	<0.5	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	0.8	<0.5	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	1.1	0.6	0.6	0.6	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.4	1.2	1.2	1.2	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	----
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	mg/kg	320	<100	<100	<100	----
C29 - C36 Fraction	----	100	mg/kg	100	<100	<100	<100	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	420	<50	<50	<50	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	----
>C10 - C16 Fraction	>C10_C16	50	mg/kg	70	<50	<50	<50	----
>C16 - C34 Fraction	----	100	mg/kg	360	<100	<100	<100	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	430	<50	<50	<50	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	70	<50	<50	<50	----
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				MH_MW02_12.0	MC_MW03_3.6	MC_MW02_2.0	MC_MW02_3.0	MH_MW02_0.2
				19-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325472-002	ES1325472-004	ES1325472-006	ES1325472-007	ES1325472-008
<b>EP080: BTEXN - Continued</b>								
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	----
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	----	63.0	65.0	77.0	----
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	95.5	95.2	89.6	----
Toluene-D8	2037-26-5	0.1	%	----	112	107	106	----
4-Bromofluorobenzene	460-00-4	0.1	%	----	104	98.7	95.0	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	96.2	103	102	103	----
2-Chlorophenol-D4	93951-73-6	0.1	%	106	113	112	113	----
2,4,6-Tribromophenol	118-79-6	0.1	%	90.8	106	104	107	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	113	116	115	116	----
Anthracene-d10	1719-06-8	0.1	%	97.5	103	101	102	----
4-Terphenyl-d14	1718-51-0	0.1	%	105	121	121	121	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	82.3	90.1	90.1	84.2	----
Toluene-D8	2037-26-5	0.1	%	103	113	109	108	----
4-Bromofluorobenzene	460-00-4	0.1	%	107	121	119	114	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MC_MW01_3.5	MC_MW01_5.5	TS3	TB	TSC3
				20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325472-010	ES1325472-011	ES1325472-012	ES1325472-013	ES1325472-014
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	9.0	11.9	----	----	----
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	----	----	----
Arsenic	7440-38-2	5	mg/kg	<5	8	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	15	16	----	----	----
Copper	7440-50-8	5	mg/kg	9	8	----	----	----
Lead	7439-92-1	5	mg/kg	16	12	----	----	----
Nickel	7440-02-0	2	mg/kg	4	15	----	----	----
Zinc	7440-66-6	5	mg/kg	43	40	----	----	----
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	----	----
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	----	----	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	----	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	----	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	----	----	----
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	----	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	----	----	----
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	----	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	----	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	----	----	----
n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	----	----	----
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	----	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	----	----	----
2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	----	----	----
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	----	----	----
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	----	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MC_MW01_3.5	MC_MW01_5.5	TS3	TB	TSC3
				20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325472-010	ES1325472-011	ES1325472-012	ES1325472-013	ES1325472-014
<b>EP074D: Fumigants - Continued</b>								
1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	----	----	----
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	----	----	----
Chloromethane	74-87-3	5	mg/kg	<5	<5	----	----	----
Vinyl chloride	75-01-4	5	mg/kg	<5	<5	----	----	----
Bromomethane	74-83-9	5	mg/kg	<5	<5	----	----	----
Chloroethane	75-00-3	5	mg/kg	<5	<5	----	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	----	----	----
1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	----	----	----
Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	----	----	----
trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	----	----	----
1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	----	----	----
cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	----	----	----
1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	----	----	----
1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	----	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	----	----	----
1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	----	----	----
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	----	----	----
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	----	----	----
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	----	----	----
1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	----	----	----
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	----	----	----
Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	----	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MC_MW01_3.5	MC_MW01_5.5	TS3	TB	TSC3
				20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325472-010	ES1325472-011	ES1325472-012	ES1325472-013	ES1325472-014
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	----	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	----	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	----	----	----
1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	----	----	----
1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	----	----	----
1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	----	----	----
1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	----	----	----
1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	----	----	----
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	----	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	----	----	----
Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	----	----	----
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	5	mg/kg	<5	<5	----	----	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	----	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	----	----	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	----	----	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	----	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	----	----	----
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	----	----	----
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	----	----	----
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	----	----	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	----	----	----
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	----	----	----
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	----	----	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	----	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	----	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MC_MW01_3.5	MC_MW01_5.5	TS3	TB	TSC3
				20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325472-010	ES1325472-011	ES1325472-012	ES1325472-013	ES1325472-014
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	----	----	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	----	----	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<b>42</b>	<10	<b>56</b>
C10 - C14 Fraction	----	50	mg/kg	<50	<50	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	----	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<b>48</b>	<10	<b>63</b>
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<b>18</b>	<10	<b>28</b>
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	----	----	----
<b>EP080: BTEXN</b>								



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MC_MW01_3.5	MC_MW01_5.5	TS3	TB	TSC3
				20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325472-010	ES1325472-011	ES1325472-012	ES1325472-013	ES1325472-014
<b>EP080: BTEXN - Continued</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.5	<0.2	0.6
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	15.1	<0.5	18.1
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	1.8	<0.5	2.0
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	9.0	<0.5	9.9
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	3.6	<0.5	3.9
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	30.0	<0.2	34.5
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	12.6	<0.5	13.8
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	94.0	96.0	----	----	----
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	84.4	99.2	----	----	----
Toluene-D8	2037-26-5	0.1	%	96.2	112	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	83.7	102	----	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	102	98.4	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	112	108	----	----	----
2,4,6-Tribromophenol	118-79-6	0.1	%	101	96.8	----	----	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	115	112	----	----	----
Anthracene-d10	1719-06-8	0.1	%	102	98.1	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	124	128	----	----	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	79.9	94.3	94.7	92.8	98.1
Toluene-D8	2037-26-5	0.1	%	98.0	113	106	101	105
4-Bromofluorobenzene	460-00-4	0.1	%	98.4	120	107	104	108





## Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP066S: PCB Surrogate</b>			
Decachlorobiphenyl	2051-24-3	39	149
<b>EP074S: VOC Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	64	130
Toluene-D8	2037-26-5	66	136
4-Bromofluorobenzene	460-00-4	60	122
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

## QUALITY CONTROL REPORT

Work Order	: <b>ES1325472</b>	Page	: 1 of 17
Client	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: 0207423 SYMPHONY	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: MT PIPER	Date Samples Received	: 22-NOV-2013
C-O-C number	: 11736	Issue Date	: 03-DEC-2013
Sampler	: GP	No. of samples received	: 14
Order number	: ----	No. of samples analysed	: 10
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :  
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
RPD = Relative Percentage Difference  
# = Indicates failed QC



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

## Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ashesh Patel	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Hamish Murray	Supervisor - Soils	Newcastle - Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics



## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EA002 : pH (Soils) (QC Lot: 3178378)</b>									
ES1325472-008	MH_MW02_0.2	EA002: pH Value	----	0.1	pH Unit	4.8	4.7	0.0	0% - 20%
ES1325594-005	Anonymous	EA002: pH Value	----	0.1	pH Unit	5.4	5.3	0.0	0% - 20%
<b>EA010: Conductivity (QC Lot: 3178379)</b>									
ES1325472-008	MH_MW02_0.2	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	55	54	0.0	0% - 20%
<b>EA055: Moisture Content (QC Lot: 3186651)</b>									
EB1328691-009	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	38.7	37.0	4.7	0% - 20%
ES1325572-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	10.1	10.0	1.2	0% - 50%
<b>ED008: Exchangeable Cations (QC Lot: 3178296)</b>									
ES1325472-008	MH_MW02_0.2	ED008: Exchangeable Calcium	----	0.1	meq/100g	3.1	2.9	4.7	0% - 20%
		ED008: Exchangeable Magnesium	----	0.1	meq/100g	0.9	0.8	0.0	0% - 20%
		ED008: Exchangeable Potassium	----	0.1	meq/100g	0.2	0.2	0.0	0% - 20%
		ED008: Exchangeable Sodium	----	0.1	meq/100g	<0.1	<0.1	0.0	0% - 20%
		ED008: Cation Exchange Capacity	----	0.1	meq/100g	4.2	4.0	4.4	0% - 20%
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3183315)</b>									
ES1325303-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	6	9	45.2	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	5	9	65.7	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	7	10	30.2	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	15	24	43.2	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	34	35	4.1	No Limit
ES1325523-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	4	5	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	4	17	132	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	17	31	57.5	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	12	16	29.0	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3183316)</b>									
ES1325303-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1325523-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 3185535)</b>									
ES1325580-002	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report							
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)		
<b>EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 3185535) - continued</b>											
ES1325580-007	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit		
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3181475)</b>											
ES1325472-004	MC_MW03_3.6	EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
ES1325613-011	Anonymous	EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
ES1325472-004	MC_MW03_3.6	EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		<b>EP074B: Oxygenated Compounds (QC Lot: 3181475)</b>									
		ES1325472-004	MC_MW03_3.6	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.0	No Limit
				EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.0	No Limit
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1			5	mg/kg	<5	<5	0.0	No Limit		
EP074: 2-Hexanone (MBK)	591-78-6			5	mg/kg	<5	<5	0.0	No Limit		
ES1325613-011	Anonymous	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.0	No Limit		
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.0	No Limit		
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.0	No Limit		
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.0	No Limit		
<b>EP074C: Sulfonated Compounds (QC Lot: 3181475)</b>											
ES1325472-004	MC_MW03_3.6	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
ES1325613-011	Anonymous	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
<b>EP074D: Fumigants (QC Lot: 3181475)</b>											
ES1325472-004	MC_MW03_3.6	EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
ES1325613-011	Anonymous	EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074D: Fumigants (QC Lot: 3181475) - continued</b>									
ES1325613-011	Anonymous	EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3181475)</b>									
ES1325472-004	MC_MW03_3.6	EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.0	No Limit
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.0	No Limit		
ES1325613-011	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		



Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3181475) - continued</b>									
ES1325613-011	Anonymous	EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.0	No Limit
EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.0	No Limit		
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.0	No Limit		
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3181475)</b>									
ES1325472-004	MC_MW03_3.6	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		ES1325613-011	Anonymous	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5
EP074: Bromobenzene	108-86-1			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP074: 2-Chlorotoluene	95-49-8			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP074: 4-Chlorotoluene	106-43-4			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP074: 1,3-Dichlorobenzene	541-73-1			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP074: 1,4-Dichlorobenzene	106-46-7			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP074: 1,2-Dichlorobenzene	95-50-1			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP074: 1,2,4-Trichlorobenzene	120-82-1			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP074: 1,2,3-Trichlorobenzene	87-61-6			0.5	mg/kg	<0.5	<0.5	0.0	No Limit

**EP074G: Trihalomethanes (QC Lot: 3181475)**



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report							
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)		
<b>EP074G: Trihalomethanes (QC Lot: 3181475) - continued</b>											
ES1325472-004	MC_MW03_3.6	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
ES1325613-011	Anonymous	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
<b>EP074H: Naphthalene (QC Lot: 3181475)</b>											
ES1325472-004	MC_MW03_3.6	EP074: Naphthalene	91-20-3	5	mg/kg	<5	<5	0.0	No Limit		
ES1325613-011	Anonymous	EP074: Naphthalene	91-20-3	5	mg/kg	<5	<5	0.0	No Limit		
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3183181)</b>											
ES1325472-002	MH_MW02_12.0	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit		
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit		
		ES1325579-003	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
				EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2-Methylphenol	95-48-7			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 2-Nitrophenol	88-75-5			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 2,4-Dimethylphenol	105-67-9			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 2,4-Dichlorophenol	120-83-2			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 2,6-Dichlorophenol	87-65-0			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4			0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP075(SIM): 3- & 4-Methylphenol	1319-77-3			1	mg/kg	<1	<1	0.0	No Limit		
EP075(SIM): Pentachlorophenol	87-86-5			2	mg/kg	<2	<2	0.0	No Limit		
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3183181)</b>											
ES1325472-002	MH_MW02_12.0			EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		





Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3183181) - continued</b>									
ES1325472-002	MH_MW02_12.0	EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	2.0	2.3	11.9	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	1.6	1.8	13.1	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	1.4	1.6	12.6	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	0.8	1.0	16.4	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	1.1	1.2	14.2	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	0.7	0.7	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	0.6	0.6	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	8.2	9.2	11.5	0% - 50%
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	0.8	0.8	0.0	No Limit
ES1325579-003	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3181474)</b>									
ES1325472-004	MC_MW03_3.6	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1325613-011	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3183180)</b>									
ES1325472-002	MH_MW02_12.0	EP071: C15 - C28 Fraction	----	100	mg/kg	320	350	9.4	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3183180) - continued</b>									
ES1325472-002	MH_MW02_12.0	EP071: C29 - C36 Fraction	----	100	mg/kg	100	120	16.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1325579-003	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3181474)</b>									
ES1325472-004	MC_MW03_3.6	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES1325613-011	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3183180)</b>									
ES1325472-002	MH_MW02_12.0	EP071: >C16 - C34 Fraction	----	100	mg/kg	360	420	13.1	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	70	60	0.0	No Limit
ES1325579-003	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3181474)</b>									
ES1325472-004	MC_MW03_3.6	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1325613-011	Anonymous	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
		EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit		



### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EA010: Conductivity (QCLot: 3178379)</b>									
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	114	70	130	
<b>ED008: Exchangeable Cations (QCLot: 3178296)</b>									
ED008: Exchangeable Calcium	----	0.1	meq/100g	<0.1	1 meq/100g	115	90	128	
ED008: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	1.67 meq/100g	93.8	86	120	
ED008: Exchangeable Potassium	----	0.1	meq/100g	<0.1	0.51 meq/100g	111	85	135	
ED008: Exchangeable Sodium	----	0.1	meq/100g	<0.1	0.87 meq/100g	106	86	128	
ED008: Cation Exchange Capacity	----	0.1	meq/100g	<0.1	----	----	----	----	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3183315)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	112	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	101	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	108	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	107	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	99.6	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	112	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	104	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	106	81	133	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3183316)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	88.4	66	112	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3185535)</b>									
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	# 127	57.4	117	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3181475)</b>									
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	104	64	126	
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	110	66	128	
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	110	63	129	
EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	106	63	129	
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	111	64	130	
EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	108	63	129	
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	109	63	129	
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	109	62	130	
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	106	61	131	
<b>EP074B: Oxygenated Compounds (QCLot: 3181475)</b>									
EP074: Vinyl Acetate	108-05-4	1	mg/kg	----	10 mg/kg	91.2	29.6	156	
		5	mg/kg	<5	----	----	----	----	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074B: Oxygenated Compounds (QCLot: 3181475) - continued</b>									
EP074: 2-Butanone (MEK)	78-93-3	1	mg/kg	----	10 mg/kg	102	58	136	
		5	mg/kg	<5	----	----	----	----	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	1	mg/kg	----	10 mg/kg	97.1	54	138	
		5	mg/kg	<5	----	----	----	----	
EP074: 2-Hexanone (MBK)	591-78-6	1	mg/kg	----	10 mg/kg	99.2	54	136	
		5	mg/kg	<5	----	----	----	----	
<b>EP074C: Sulfonated Compounds (QCLot: 3181475)</b>									
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	103	54	126	
<b>EP074D: Fumigants (QCLot: 3181475)</b>									
EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	104	55	133	
EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	112	69	127	
EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	90.3	54	124	
EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	87.6	51	125	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	102	66	126	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3181475)</b>									
EP074: Dichlorodifluoromethane	75-71-8	1	mg/kg	----	10 mg/kg	102	30	148	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloromethane	74-87-3	1	mg/kg	----	10 mg/kg	109	41	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Vinyl chloride	75-01-4	1	mg/kg	----	10 mg/kg	93.6	43	147	
		5	mg/kg	<5	----	----	----	----	
EP074: Bromomethane	74-83-9	1	mg/kg	----	10 mg/kg	107	47	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloroethane	75-00-3	1	mg/kg	----	10 mg/kg	122	49	143	
		5	mg/kg	<5	----	----	----	----	
EP074: Trichlorofluoromethane	75-69-4	1	mg/kg	----	10 mg/kg	116	49	135	
		5	mg/kg	<5	----	----	----	----	
EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	118	54	126	
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	90.6	43	129	
EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	103	62	130	
EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	106	66	132	
EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	100	66	132	
EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	102	62	126	
EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	106	64	128	
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	94.2	59	125	
EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	103	65	123	
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	106	64	120	
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	95.1	65	127	
EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	106	70	130	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3181475) - continued</b>									
EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	99.8	72	128	
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	106	67	143	
EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	87.3	62	122	
EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	106	54	128	
EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	95.6	55	129	
EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	99.4	56	132	
EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	105	65	135	
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	80.6	19.8	134	
EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	81.9	53	129	
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	118	48	136	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3181475)</b>									
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	114	70	128	
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	106	67	127	
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	110	64	130	
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	108	62	130	
EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	111	63	129	
EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	109	63	129	
EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	107	66	128	
EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	108	54	134	
EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	111	60	132	
<b>EP074G: Trihalomethanes (QCLot: 3181475)</b>									
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	107	62	120	
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	92.0	61	121	
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	85.3	63	121	
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	93.4	60	126	
<b>EP074H: Naphthalene (QCLot: 3181475)</b>									
EP074: Naphthalene	91-20-3	0.5	mg/kg	----	1 mg/kg	85.6	63	133	
		5	mg/kg	<5	----	----	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3183181)</b>									
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	98.3	74	116	
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	98.2	74	116	
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	104	72	116	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	105	69	123	
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	89.4	60.3	117	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	99.3	69	117	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	100	68	112	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	106	73	117	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	101	76.4	114	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3183181) - continued</b>									
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	100	57	111	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	95.9	68.9	112	
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	33.7	3.9	57	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3183181)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	106	80	124	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	111	77	123	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	111	79	123	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	113	77	123	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	111	79	123	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	112	79	123	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	112	79	123	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	113	79	125	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	111	73	121	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	107	81	123	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	100	70	118	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	110	77	123	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	110	76	122	
EP075(SIM): Indeno(1,2,3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	104	71	113	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	108	71.7	113	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	105	72.4	114	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3181474)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	106	68.4	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3183180)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	92.7	71	131	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	101	74	138	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	93.5	64	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3181474)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	108	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3183180)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	93.8	70	130	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	101	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	
		50	mg/kg	----	150 mg/kg	85.8	63	131	
<b>EP080: BTEXN (QCLot: 3181474)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	96.7	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	103	62	128	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	106	58	118	



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
<b>EP080: BTEXN (QCLot: 3181474) - continued</b>								
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	108	60	120
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	112	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	99.0	62	138

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%) Low High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3183315)</b>							
ES1325303-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	100	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	97.2	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	100	70	130
		EG005T: Copper	7440-50-8	125 mg/kg	107	70	130
		EG005T: Lead	7439-92-1	125 mg/kg	96.4	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	103	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	106	70	130
		EG005T: Zinc	7440-66-6	125 mg/kg	92.0	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3183316)</b>							
ES1325303-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	93.9	70	130
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3185535)</b>							
ES1325580-002	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	127	70	130
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3181475)</b>							
ES1325472-004	MC_MW03_3.6	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	86.3	70	130
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	96.9	70	130
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3181475)</b>							
ES1325472-004	MC_MW03_3.6	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	112	70	130
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3183181)</b>							
ES1325472-002	MH_MW02_12.0	EP075(SIM): Phenol	108-95-2	10 mg/kg	92.1	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	94.4	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	85.9	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	95.2	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	38.1	20	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3183181)</b>							





Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report				
				Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3183181) - continued</b>								
ES1325472-002	MH_MW02_12.0	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	102	70	130	
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	96.0	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3181474)</b>								
ES1325472-004	MC_MW03_3.6	EP080: C6 - C9 Fraction	----	32.5 mg/kg	78.5	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3183180)</b>								
ES1325472-002	MH_MW02_12.0	EP071: C10 - C14 Fraction	----	640 mg/kg	99.3	73	137	
		EP071: C15 - C28 Fraction	----	3140 mg/kg	105	53	131	
		EP071: C29 - C36 Fraction	----	2860 mg/kg	92.9	52	132	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3181474)</b>								
ES1325472-004	MC_MW03_3.6	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	81.2	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3183180)</b>								
ES1325472-002	MH_MW02_12.0	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	128	73	137	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	97.4	53	131	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	73.8	52	132	
<b>EP080: BTEXN (QCLot: 3181474)</b>								
ES1325472-004	MC_MW03_3.6	EP080: Benzene	71-43-2	2.5 mg/kg	70.8	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	78.3	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	82.2	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	81.4	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	85.3	70	130	
	91-20-3	2.5 mg/kg	90.8	70	130			

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3181474)</b>										
ES1325472-004	MC_MW03_3.6	EP080: C6 - C9 Fraction	----	32.5 mg/kg	78.5	----	70	130	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3181474)</b>										
ES1325472-004	MC_MW03_3.6	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	81.2	----	70	130	----	----
<b>EP080: BTEXN (QCLot: 3181474)</b>										
ES1325472-004	MC_MW03_3.6	EP080: Benzene	71-43-2	2.5 mg/kg	70.8	----	70	130	----	----
		EP080: Toluene	108-88-3	2.5 mg/kg	78.3	----	70	130	----	----





Sub-Matrix: SOIL

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>EP080: BTEXN (QCLot: 3181474) - continued</b>										
ES1325472-004	MC_MW03_3.6	EP080: Ethylbenzene	100-41-4	2.5 mg/kg	82.2	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	81.4	----	70	130	----	----
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	85.3	----	70	130	----	----
		EP080: Naphthalene	91-20-3	2.5 mg/kg	90.8	----	70	130	----	----
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3181475)</b>										
ES1325472-004	MC_MW03_3.6	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	86.3	----	70	130	----	----
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	96.9	----	70	130	----	----
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3181475)</b>										
ES1325472-004	MC_MW03_3.6	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	112	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3183180)</b>										
ES1325472-002	MH_MW02_12.0	EP071: C10 - C14 Fraction	----	640 mg/kg	99.3	----	73	137	----	----
		EP071: C15 - C28 Fraction	----	3140 mg/kg	105	----	53	131	----	----
		EP071: C29 - C36 Fraction	----	2860 mg/kg	92.9	----	52	132	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3183180)</b>										
ES1325472-002	MH_MW02_12.0	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	128	----	73	137	----	----
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	97.4	----	53	131	----	----
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	73.8	----	52	132	----	----
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3183181)</b>										
ES1325472-002	MH_MW02_12.0	EP075(SIM): Phenol	108-95-2	10 mg/kg	92.1	----	70	130	----	----
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	94.4	----	70	130	----	----
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	85.9	----	60	130	----	----
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	95.2	----	70	130	----	----
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	38.1	----	20	130	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3183181)</b>										
ES1325472-002	MH_MW02_12.0	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	102	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	96.0	----	70	130	----	----
<b>EG005T: Total Metals by ICP-AES (QCLot: 3183315)</b>										
ES1325303-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	100	----	70	130	----	----
		EG005T: Cadmium	7440-43-9	50 mg/kg	97.2	----	70	130	----	----
		EG005T: Chromium	7440-47-3	50 mg/kg	100	----	70	130	----	----
		EG005T: Copper	7440-50-8	125 mg/kg	107	----	70	130	----	----
		EG005T: Lead	7439-92-1	125 mg/kg	96.4	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	103	----	70	130	----	----
		EG005T: Selenium	7782-49-2	50 mg/kg	106	----	70	130	----	----
		EG005T: Zinc	7440-66-6	125 mg/kg	92.0	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3183316)</b>										
ES1325303-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	93.9	----	70	130	----	----

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 Work Order : ES1325472  
 Client : ENVIRO RESOURCES MANAGEMENT  
 Project : 0207423 SYMPHONY



Sub-Matrix: SOIL

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
				Concentration	MS	MSD	Low	High	Value	Control Limit
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3185535)</b>										
ES1325580-002	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	127	----	70	130	----	----

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1325472</b>	Page	: 1 of 10
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
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Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: 0207423 SYMPHONY	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: MT PIPER	Date Samples Received	: 22-NOV-2013
C-O-C number	: 11736	Issue Date	: 03-DEC-2013
Sampler	: GP	No. of samples received	: 14
Order number	: ----	No. of samples analysed	: 10
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers





Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EG035T: Total Recoverable Mercury by FIMS</b>							
Soil Glass Jar - Unpreserved (EG035T) MH_MW02_12.0	19-NOV-2013	28-NOV-2013	17-DEC-2013	✓	29-NOV-2013	17-DEC-2013	✓
Soil Glass Jar - Unpreserved (EG035T) MC_MW03_3.6, MC_MW02_3.0, MC_MW01_5.5 MC_MW02_2.0, MC_MW01_3.5	20-NOV-2013	28-NOV-2013	18-DEC-2013	✓	29-NOV-2013	18-DEC-2013	✓
<b>EP066: Polychlorinated Biphenyls (PCB)</b>							
Soil Glass Jar - Unpreserved (EP066) MC_MW03_3.6, MC_MW02_3.0, MC_MW01_5.5 MC_MW02_2.0, MC_MW01_3.5	20-NOV-2013	29-NOV-2013	04-DEC-2013	✓	30-NOV-2013	08-JAN-2014	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>							
Soil Glass Jar - Unpreserved (EP071) MH_MW02_12.0	19-NOV-2013	29-NOV-2013	03-DEC-2013	✓	30-NOV-2013	08-JAN-2014	✓
Soil Glass Jar - Unpreserved (EP071) MC_MW03_3.6, MC_MW02_3.0, MC_MW01_5.5 MC_MW02_2.0, MC_MW01_3.5	20-NOV-2013	29-NOV-2013	04-DEC-2013	✓	30-NOV-2013	08-JAN-2014	✓
<b>EP074D: Fumigants</b>							
Soil Glass Jar - Unpreserved (EP074) MC_MW03_3.6, MC_MW02_3.0, MC_MW01_5.5 MC_MW02_2.0, MC_MW01_3.5	20-NOV-2013	27-NOV-2013	27-NOV-2013	✓	27-NOV-2013	27-NOV-2013	✓
<b>EP074E: Halogenated Aliphatic Compounds</b>							
Soil Glass Jar - Unpreserved (EP074) MC_MW03_3.6, MC_MW02_3.0, MC_MW01_5.5 MC_MW02_2.0, MC_MW01_3.5	20-NOV-2013	27-NOV-2013	27-NOV-2013	✓	27-NOV-2013	27-NOV-2013	✓
<b>EP074F: Halogenated Aromatic Compounds</b>							
Soil Glass Jar - Unpreserved (EP074) MC_MW03_3.6, MC_MW02_3.0, MC_MW01_5.5 MC_MW02_2.0, MC_MW01_3.5	20-NOV-2013	27-NOV-2013	27-NOV-2013	✓	27-NOV-2013	27-NOV-2013	✓
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>							
Soil Glass Jar - Unpreserved (EP074) MC_MW03_3.6, MC_MW02_3.0, MC_MW01_5.5 MC_MW02_2.0, MC_MW01_3.5	20-NOV-2013	27-NOV-2013	27-NOV-2013	✓	27-NOV-2013	27-NOV-2013	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP074H: Naphthalene</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MC_MW03_3.6, MC_MW02_3.0, MC_MW01_5.5	MC_MW02_2.0, MC_MW01_3.5	20-NOV-2013	27-NOV-2013	27-NOV-2013	✓	27-NOV-2013	27-NOV-2013	✓
<b>EP074B: Oxygenated Compounds</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MC_MW03_3.6, MC_MW02_3.0, MC_MW01_5.5	MC_MW02_2.0, MC_MW01_3.5	20-NOV-2013	27-NOV-2013	27-NOV-2013	✓	27-NOV-2013	27-NOV-2013	✓
<b>EP074C: Sulfonated Compounds</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MC_MW03_3.6, MC_MW02_3.0, MC_MW01_5.5	MC_MW02_2.0, MC_MW01_3.5	20-NOV-2013	27-NOV-2013	27-NOV-2013	✓	27-NOV-2013	27-NOV-2013	✓
<b>EP074G: Trihalomethanes</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MC_MW03_3.6, MC_MW02_3.0, MC_MW01_5.5	MC_MW02_2.0, MC_MW01_3.5	20-NOV-2013	27-NOV-2013	27-NOV-2013	✓	27-NOV-2013	27-NOV-2013	✓
<b>EP075(SIM)A: Phenolic Compounds</b>								
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MH_MW02_12.0		19-NOV-2013	29-NOV-2013	03-DEC-2013	✓	30-NOV-2013	08-JAN-2014	✓
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MC_MW03_3.6, MC_MW02_3.0, MC_MW01_5.5	MC_MW02_2.0, MC_MW01_3.5	20-NOV-2013	29-NOV-2013	04-DEC-2013	✓	30-NOV-2013	08-JAN-2014	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MH_MW02_12.0		19-NOV-2013	29-NOV-2013	03-DEC-2013	✓	30-NOV-2013	08-JAN-2014	✓
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b> MC_MW03_3.6, MC_MW02_3.0, MC_MW01_5.5	MC_MW02_2.0, MC_MW01_3.5	20-NOV-2013	29-NOV-2013	04-DEC-2013	✓	30-NOV-2013	08-JAN-2014	✓
<b>EP080: BTEXN</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b> MH_MW02_12.0		19-NOV-2013	27-NOV-2013	03-DEC-2013	✓	27-NOV-2013	03-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b> MC_MW03_3.6, MC_MW02_3.0, MC_MW01_5.5, TB,	MC_MW02_2.0, MC_MW01_3.5, TS3, TSC3	20-NOV-2013	27-NOV-2013	04-DEC-2013	✓	27-NOV-2013	04-DEC-2013	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b> MH_MW02_12.0	19-NOV-2013	27-NOV-2013	03-DEC-2013	✓	27-NOV-2013	03-DEC-2013	✓	
<b>Soil Glass Jar - Unpreserved (EP080)</b> MC_MW03_3.6, MC_MW02_3.0, MC_MW01_5.5, TB,	MC_MW02_2.0, MC_MW01_3.5, TS3, TSC3	20-NOV-2013	27-NOV-2013	04-DEC-2013	✓	27-NOV-2013	04-DEC-2013	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Electrical Conductivity (1:5)	EA010	1	5	20.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Exchangeable Cations with pre-treatment	ED008	1	1	100.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Moisture Content	EA055-103	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
pH (1:5)	EA002	2	12	16.7	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	17	11.8	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	12	16.7	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
Electrical Conductivity (1:5)	EA010	1	5	20.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Exchangeable Cations with pre-treatment	ED008	1	1	100.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
Electrical Conductivity (1:5)	EA010	1	5	20.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Exchangeable Cations with pre-treatment	ED008	1	1	100.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	17	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement





Matrix: **SOIL** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Matrix Spikes (MS) - Continued</b>							
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH (1:5)	EA002	SOIL	(APHA 21st ed., 4500H+) pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM (2013) Schedule B(3) (Method 103)
Electrical Conductivity (1:5)	EA010	SOIL	(APHA 21st ed., 2510) Conductivity is determined on soil samples using a 1:5 soil/water leach. This method is compliant with NEPM (2013) Schedule B(3) (Method 104)
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Particle Size Analysis by Hydrometer	EA150H	SOIL	Particle Size Analysis by Hydrometer according to AS1289.3.6.3 - 2003
Exchangeable Cations with pre-treatment	ED008	SOIL	Rayment & Higginson (1992) Method 15A2. Soluble salts are removed from the sample prior to analysis. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. This method is compliant with NEPM (2013) Schedule B(3) (Method 301)
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (2013) Schedule B(3) (Method 506.1)
Volatile Organic Compounds	EP074	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
Preparation Methods	Method	Matrix	Method Descriptions
Exchangeable Cations Preparation Method	ED007PR	SOIL	Rayment & Higginson (1992) method 15A1. A 1M NH <sub>4</sub> Cl extraction by end over end tumbling at a ratio of 1:20. There is no pretreatment for soluble salts. Extracts can be run by ICP for cations.



<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of distilled water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option A - Concentrating)	ORG17A	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.



## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Laboratory Control Spike (LCS) Recoveries</b>							
EP066: Polychlorinated Biphenyls (PCB)	3801855-002	----	<b>Total Polychlorinated biphenyls</b>	----	127 %	57.4-117%	<b>Recovery greater than upper control limit</b>

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Matrix Spike outliers occur.

#### Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- No Analysis Holding Time Outliers exist.

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

**Work Order : ES1325472**

<p><b>Client : ENVIRO RESOURCES MANAGEMENT</b></p> <p><b>Contact : MR JONATHAN LEKAWSKI</b></p> <p><b>Address : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007</b></p>	<p><b>Laboratory : Environmental Division Sydney</b></p> <p><b>Contact : Barbara Hanna</b></p> <p><b>Address : 277-289 Woodpark Road Smithfield NSW Australia 2164</b></p>
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<p><b>E-mail : jonathan.lekawski@erm.com</b></p> <p><b>Telephone : +61 02 8584 8888</b></p> <p><b>Facsimile : +61 02 8584 8800</b></p>	<p><b>E-mail : Barbara.Hanna@alsglobal.com</b></p> <p><b>Telephone : +61 2 8784 8555</b></p> <p><b>Facsimile : +61 2 8784 8555</b></p>
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<p><b>Project : 0207423 SYMPHONY</b></p> <p><b>Order number : ----</b></p> <p><b>C-O-C number : 11736</b></p> <p><b>Site : MT PIPER</b></p> <p><b>Sampler : GP</b></p>	<p><b>Page : 1 of 3</b></p> <p><b>Quote number : ES2013ENVRES0370 (SY/278/13 V3)</b></p> <p><b>QC Level : NEPM 2013 Schedule B(3) and ALS QCS3 requirement</b></p>
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#### Dates

<p><b>Date Samples Received : 22-NOV-2013</b></p> <p><b>Client Requested Due Date : 03-DEC-2013</b></p>	<p><b>Issue Date : 25-NOV-2013 14:25</b></p> <p><b>Scheduled Reporting Date : <b>03-DEC-2013</b></b></p>
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#### Delivery Details

<p><b>Mode of Delivery : Carrier</b></p> <p><b>No. of coolers/boxes : 1 HARD</b></p> <p><b>Security Seal : Intact.</b></p>	<p><b>Temperature : 12.8°C - Ice bricks present</b></p> <p><b>No. of samples received : 14</b></p> <p><b>No. of samples analysed : 10</b></p>
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#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Samples received in appropriately pretreated and preserved containers.
- Samples TS3 and TB were received extra and will be analysed for TPH C6-C10/ BTEX. Please notify if this is not required.
- **Samples received in appropriately pretreated and preserved containers.**
- **Particle Size analysis will be conducted by ALS Newcastle.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA002 pH (1:5)	SOIL - EA010 (solids): Electrical Conductivity (1:5) Electrical Conductivity (1:5)	SOIL - ED008 Exchangeable Cations with pre-treatment-All	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP066 (solids) Polychlorinated Biphenyls by GCMS	SOIL - EP074 (solids) Volatile Organic Compounds	SOIL - S-18 (NO MOIST) TRH(C6-C9)/BTEXN with No Moisture for TBs
ES1325472-001	19-NOV-2013 15:00	MH_MW02_6.5	✓							
ES1325472-002	19-NOV-2013 15:00	MH_MW02_12.0					✓			
ES1325472-003	19-NOV-2013 15:00	MH_MW02_14.0	✓							
ES1325472-004	20-NOV-2013 15:00	MC_MW03_3.6					✓	✓	✓	
ES1325472-005	20-NOV-2013 15:00	MC_MW03_4.0	✓							
ES1325472-006	20-NOV-2013 15:00	MC_MW02_2.0					✓	✓	✓	
ES1325472-007	20-NOV-2013 15:00	MC_MW02_3.0					✓	✓	✓	
ES1325472-008	20-NOV-2013 15:00	MH_MW02_0.2		✓	✓	✓				
ES1325472-009	20-NOV-2013 15:00	MC_MW01_1.5	✓							
ES1325472-010	20-NOV-2013 15:00	MC_MW01_3.5					✓	✓	✓	
ES1325472-011	20-NOV-2013 15:00	MC_MW01_5.5					✓	✓	✓	
ES1325472-012	20-NOV-2013 15:00	TS3								✓
ES1325472-013	20-NOV-2013 15:00	TB								✓
ES1325472-014	20-NOV-2013 15:00	TSC3								✓

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - S-27 TRH/BTEXN/PAH/Phenols/8Metals
ES1325472-002	19-NOV-2013 15:00	MH_MW02_12.0	✓
ES1325472-004	20-NOV-2013 15:00	MC_MW03_3.6	✓
ES1325472-006	20-NOV-2013 15:00	MC_MW02_2.0	✓
ES1325472-007	20-NOV-2013 15:00	MC_MW02_3.0	✓
ES1325472-010	20-NOV-2013 15:00	MC_MW01_3.5	✓
ES1325472-011	20-NOV-2013 15:00	MC_MW01_5.5	✓

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Attachment - Report ( SUBCO )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

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Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Attachment - Report ( SUBCO )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

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### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

**SAMPLE RECEIPT NOTIFICATION (SRN)****Comprehensive Report**

**Work Order** : **ES1325472**

**Client** : **ENVIRO RESOURCES MANAGEMENT**      **Laboratory** : Environmental Division Sydney

**Contact** : MR JONATHAN LEKAWSKI      **Contact** : Barbara Hanna  
**Address** : GROUND FLOOR      **Address** : 277-289 Woodpark Road Smithfield  
33 SAUNDERS STREET, PYRMONT      NSW Australia 2164  
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**Telephone** : +61 02 8584 8888      **Telephone** : +61 2 8784 8555  
**Facsimile** : +61 02 8584 8800      **Facsimile** : +61 2 8784 8555

**Project** : 0207423 SYMPHONY      **Page** : 1 of 3  
**Order number** : ----  
**C-O-C number** : 11736      **Quote number** : ES2013ENVRES0370 (SY/278/13 V3)  
**Site** : MT PIPER  
**Sampler** : GP      **QC Level** : NEPM 2013 Schedule B(3) and ALS QCS3 requirement

**Dates**

**Date Samples Received** : 22-NOV-2013      **Issue Date** : 25-NOV-2013 15:18  
**Client Requested Due Date** : 03-DEC-2013      **Scheduled Reporting Date** : **03-DEC-2013**

**Delivery Details**

**Mode of Delivery** : Carrier      **Temperature** : 12.8°C - Ice bricks present  
**No. of coolers/boxes** : 1 HARD      **No. of samples received** : 14  
**Security Seal** : Intact.      **No. of samples analysed** : 10

**General Comments**

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Samples received in appropriately pretreated and preserved containers.
- Samples TS3 and TB were received extra and will be analysed for TPH C6-C10/ BTEX. Please notify if this is not required.
- **Samples received in appropriately pretreated and preserved containers.**
- **Particle Size analysis will be conducted by ALS Newcastle.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.





## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA002 pH (1:5)	SOIL - EA010 (solids): Electrical Conductivity (1:5) Electrical Conductivity (1:5)	SOIL - EA150H Particle Size Analysis by Hydrometer: AS1289	SOIL - ED008 Exchangeable Cations with pre-treatment -All	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP066 (solids) Polychlorinated Biphenyls by GCMS	SOIL - EP074 (solids) Volatile Organic Compounds
ES1325472-001	19-NOV-2013 15:00	MH_MW02_6.5	✓							
ES1325472-002	19-NOV-2013 15:00	MH_MW02_12.0						✓		
ES1325472-003	19-NOV-2013 15:00	MH_MW02_14.0	✓							
ES1325472-004	20-NOV-2013 15:00	MC_MW03_3.6						✓	✓	✓
ES1325472-005	20-NOV-2013 15:00	MC_MW03_4.0	✓							
ES1325472-006	20-NOV-2013 15:00	MC_MW02_2.0						✓	✓	✓
ES1325472-007	20-NOV-2013 15:00	MC_MW02_3.0						✓	✓	✓
ES1325472-008	20-NOV-2013 15:00	MH_MW02_0.2		✓	✓	✓	✓			
ES1325472-009	20-NOV-2013 15:00	MC_MW01_1.5	✓							
ES1325472-010	20-NOV-2013 15:00	MC_MW01_3.5						✓	✓	✓
ES1325472-011	20-NOV-2013 15:00	MC_MW01_5.5						✓	✓	✓

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - S-18 (NO MOIST) TRH(C6-C9)/BTEXN with No Moisture for TBs	SOIL - S-27 TRH/BTEXN/PAH/Phenols/8Metals
ES1325472-002	19-NOV-2013 15:00	MH_MW02_12.0		✓
ES1325472-004	20-NOV-2013 15:00	MC_MW03_3.6		✓
ES1325472-006	20-NOV-2013 15:00	MC_MW02_2.0		✓
ES1325472-007	20-NOV-2013 15:00	MC_MW02_3.0		✓
ES1325472-010	20-NOV-2013 15:00	MC_MW01_3.5		✓
ES1325472-011	20-NOV-2013 15:00	MC_MW01_5.5		✓
ES1325472-012	20-NOV-2013 15:00	TS3	✓	
ES1325472-013	20-NOV-2013 15:00	TB	✓	
ES1325472-014	20-NOV-2013 15:00	TSC3	✓	

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
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- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

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Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Attachment - Report ( SUBCO )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
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Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com





## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>ES1325473</b> <b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : MR JONATHAN LEKAWSKI <b>Address</b> : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007  <b>E-mail</b> : jonathan.lekawski@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800 <b>Project</b> : PROJECT SYMPHONY - MP <b>Order number</b> : 0207423 <b>C-O-C number</b> : ---- <b>Sampler</b> : TS <b>Site</b> : ----  <b>Quote number</b> : SY/278/13 V3	<b>Page</b> : 1 of 9  <b>Laboratory</b> : Environmental Division Sydney <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164  <b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555 <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement  <b>Date Samples Received</b> : 22-NOV-2013 <b>Issue Date</b> : 30-NOV-2013  <b>No. of samples received</b> : 17 <b>No. of samples analysed</b> : 9
--	--

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Phalak Inthaksono	Laboratory Manager - Organics	Sydney Organics



### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EG005: Poor precision was obtained for some elements on sample ES1325491 #054. Results have been confirmed by re-extraction and reanalysis.**
-



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MB-MW05-3.5	MB-MW02-3.0	ML-MW07-2.0	MK-SB78-3.9	MK-SB71-1.8
				19-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325473-001	ES1325473-002	ES1325473-003	ES1325473-004	ES1325473-006
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	16.7	10.4	14.8	9.5	9.5
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	5	18	12	24	6
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	15	18	9	15	11
Copper	7440-50-8	5	mg/kg	14	32	29	48	22
Lead	7439-92-1	5	mg/kg	24	26	26	34	21
Nickel	7440-02-0	2	mg/kg	7	74	60	90	36
Zinc	7440-66-6	5	mg/kg	8	103	98	114	67
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	0.7	1.0	0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	0.6	0.7	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MB-MW05-3.5	MB-MW02-3.0	ML-MW07-2.0	MK-SB78-3.9	MK-SB71-1.8
				19-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325473-001	ES1325473-002	ES1325473-003	ES1325473-004	ES1325473-006
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	1.3	1.7	0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	1.2	1.2	1.2
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	12	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	11	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	0.5	0.8	0.6	<0.5





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MB-MW05-3.5	MB-MW02-3.0	ML-MW07-2.0	MK-SB78-3.9	MK-SB71-1.8
				19-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325473-001	ES1325473-002	ES1325473-003	ES1325473-004	ES1325473-006
<b>EP080: BTEXN - Continued</b>								
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	0.5	0.8	0.6	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	0.5	0.8	0.6	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	92.6	102	104	103	92.5
2-Chlorophenol-D4	93951-73-6	0.1	%	91.1	96.5	107	95.2	88.8
2,4,6-Tribromophenol	118-79-6	0.1	%	82.2	79.2	79.0	83.9	76.5
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	87.3	91.6	94.0	94.6	83.8
Anthracene-d10	1719-06-8	0.1	%	78.7	83.1	83.6	88.6	81.0
4-Terphenyl-d14	1718-51-0	0.1	%	71.4	79.6	78.5	83.4	72.2
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	85.4	92.0	83.8	100	87.0
Toluene-D8	2037-26-5	0.1	%	84.5	101	91.6	105	85.8
4-Bromofluorobenzene	460-00-4	0.1	%	85.2	103	94.5	102	86.0



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK-SB44-2.5	MK-SB43-1.6	MK-SB24-2.0	MK-SB30-2.7	----
				20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1325473-007	ES1325473-008	ES1325473-009	ES1325473-010	----
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	9.2	10.4	13.3	21.1	----
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	----
Arsenic	7440-38-2	5	mg/kg	12	13	9	11	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	----
Chromium	7440-47-3	2	mg/kg	8	21	3	16	----
Copper	7440-50-8	5	mg/kg	20	21	18	11	----
Lead	7439-92-1	5	mg/kg	19	25	16	18	----
Nickel	7440-02-0	2	mg/kg	39	57	4	18	----
Zinc	7440-66-6	5	mg/kg	73	70	26	63	----
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	0.6	<0.5	<0.5	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK-SB44-2.5	MK-SB43-1.6	MK-SB24-2.0	MK-SB30-2.7	----
				20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	----
Compound	CAS Number	LOR	Unit	ES1325473-007	ES1325473-008	ES1325473-009	ES1325473-010	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<b>0.6</b>	<0.5	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	----
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	----
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	----
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				MK-SB44-2.5	MK-SB43-1.6	MK-SB24-2.0	MK-SB30-2.7	----
				20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	----
				ES1325473-007	ES1325473-008	ES1325473-009	ES1325473-010	----
Compound	CAS Number	LOR	Unit					
<b>EP080: BTEXN - Continued</b>								
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	91.1	92.1	87.1	95.5	----
2-Chlorophenol-D4	93951-73-6	0.1	%	88.5	87.8	83.4	97.5	----
2,4,6-Tribromophenol	118-79-6	0.1	%	72.3	71.2	71.4	72.5	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	86.8	80.1	85.8	92.4	----
Anthracene-d10	1719-06-8	0.1	%	79.3	79.4	76.9	83.5	----
4-Terphenyl-d14	1718-51-0	0.1	%	70.7	72.4	66.3	69.4	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	89.8	87.4	84.6	82.7	----
Toluene-D8	2037-26-5	0.1	%	85.2	86.5	79.4	83.9	----
4-Bromofluorobenzene	460-00-4	0.1	%	85.1	84.4	79.4	84.3	----



## Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: ES1325473</b>	<b>Page</b>	: 1 of 12
<b>Client</b>	<b>: ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	<b>: MR JONATHAN LEKAWSKI</b>	<b>Contact</b>	: Barbara Hanna
<b>Address</b>	<b>: GROUND FLOOR</b> 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: jonathan.lekawski@erm.com	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: PROJECT SYMPHONY - MP	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b>	: ----	<b>Date Samples Received</b>	: 22-NOV-2013
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: 30-NOV-2013
<b>Sampler</b>	: TS	<b>No. of samples received</b>	: 17
<b>Order number</b>	: 0207423	<b>No. of samples analysed</b>	: 9
<b>Quote number</b>	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

#### Signatories

Celine Conceicao  
Phalak Inthaksone

#### Position

Senior Spectroscopist  
Laboratory Manager - Organics

#### Accreditation Category

Sydney Inorganics  
Sydney Organics



### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :  
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
RPD = Relative Percentage Difference  
# = Indicates failed QC



## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EA055: Moisture Content (QC Lot: 3183956)</b>									
ES1325413-003	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	14.4	13.0	10.5	0% - 50%
ES1325473-008	MK-SB43-1.6	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	10.4	10.2	2.4	0% - 50%
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3181226)</b>									
ES1325446-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	27	25	7.9	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	21	18	10.7	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	11	13	9.7	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	30	26	10.9	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	45	44	4.2	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	162	158	2.8	0% - 20%
ES1325446-011	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	18	13	29.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	2	3	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	21	19	10.5	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	70	58	18.0	0% - 50%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	145	122	17.5	0% - 20%
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3181228)</b>									
ES1325473-009	MK-SB24-2.0	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	3	5	47.7	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	4	10	85.4	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	9	8	16.1	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	18	25	34.4	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	16	22	32.3	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	26	46	54.7	No Limit
ES1325491-054	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	1	1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	40	52	# 26.0	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	11	14	22.3	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	271	407	# 40.0	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	414	593	# 35.7	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	3900	4850	# 21.7	0% - 20%





Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3181227)</b>									
ES1325446-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.5	0.4	0.0	No Limit
ES1325446-011	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3181229)</b>									
ES1325473-009	MK-SB24-2.0	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1325491-054	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3177345)</b>									
ES1325473-001	MB-MW05-3.5	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
ES1325477-002	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.8	<0.8	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.8	<0.8	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.8	<0.8	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.8	<0.8	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.8	<0.8	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.8	<0.8	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.8	<0.8	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.8	<0.8	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.8	<0.8	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.8	<0.8	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<2	<2	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3177345)</b>									
ES1325473-001	MB-MW05-3.5	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3177345) - continued</b>									
ES1325473-001	MB-MW05-3.5	EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1325477-002	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.8	<0.8	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.8	<0.8	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.8	<0.8	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.8	<0.8	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.8	<0.8	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.8	<0.8	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.8	<0.8	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.8	<0.8	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.8	<0.8	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.8	<0.8	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.8	<0.8	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.8	<0.8	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.8	<0.8	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.8	<0.8	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.8	<0.8	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.8	<0.8	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3177344)</b>									
ES1325473-001	MB-MW05-3.5	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1325477-002	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	290	290	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	210	190	11.3	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3181456)</b>									
ES1325548-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	411	436	5.8	0% - 20%
ES1325481-013	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3177344)</b>									



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3177344) - continued</b>									
ES1325473-001	MB-MW05-3.5	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
ES1325477-002	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	460	430	5.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3181456)</b>									
ES1325548-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	604	639	5.7	0% - 20%
ES1325481-013	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3181456)</b>									
ES1325548-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	8.7	9.6	9.9	0% - 50%
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	61.9	67.0	8.0	0% - 20%
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	9.3	10.3	9.6	0% - 20%
		EP080: Naphthalene	91-20-3	1	mg/kg	5	6	0.0	No Limit
ES1325481-013	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit



## Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3181226)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	119	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	110	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	115	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	122	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	112	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	120	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	119	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	113	81	133	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3181228)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	112	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	106	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	113	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	118	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	106	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	116	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	95.0	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	109	81	133	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3181227)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	89.2	66	112	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3181229)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	86.0	66	112	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3177345)</b>									
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	108	74	116	
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	108	74	116	
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	111	72	116	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	103	69	123	
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	84.8	60.3	117	
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	107	69	117	
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	101	68	112	
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	105	73	117	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	94.9	76.4	114	
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	85.1	57	111	
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	81.5	68.9	112	
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	20.3	3.9	57	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3177345)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	111	80	124	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	107	77	123	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	111	79	123	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	111	77	123	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	113	79	123	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	112	79	123	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	112	79	123	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	116	79	125	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	102	73	121	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	111	81	123	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	103	70	118	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	103	77	123	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	110	76	122	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	105	71	113	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	105	71.7	113	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	100	72.4	114	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3177344)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	119	71	131	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	113	74	138	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	91.0	64	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3181456)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	87.4	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3177344)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	113	70	130	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	106	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	
		50	mg/kg	----	150 mg/kg	74.2	63	131	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3181456)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	86.9	68.4	128	
<b>EP080: BTEXN (QCLot: 3181456)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	90.4	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	90.0	62	128	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	89.4	58	118	
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	88.2	60	120	
	106-42-3								
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	91.9	60	120	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	101	62	138	



## Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Concentration	Spike Recovery(%) MS	Recovery Limits (%) Low High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3181226)</b>							
ES1325446-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	103	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	105	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	99.1	70	130
		EG005T: Copper	7440-50-8	125 mg/kg	105	70	130
		EG005T: Lead	7439-92-1	125 mg/kg	103	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	99.6	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	109	70	130
		EG005T: Zinc	7440-66-6	125 mg/kg	91.9	70	130
<b>EG005T: Total Metals by ICP-AES (QCLot: 3181228)</b>							
ES1325473-009	MK-SB24-2.0	EG005T: Arsenic	7440-38-2	50 mg/kg	115	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	103	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	108	70	130
		EG005T: Copper	7440-50-8	125 mg/kg	111	70	130
		EG005T: Lead	7439-92-1	125 mg/kg	105	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	128	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	106	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	71.3	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3181227)</b>							
ES1325446-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	103	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3181229)</b>							
ES1325473-009	MK-SB24-2.0	EG035T: Mercury	7439-97-6	5 mg/kg	103	70	130
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3177345)</b>							
ES1325473-001	MB-MW05-3.5	EP075(SIM): Phenol	108-95-2	10 mg/kg	89.5	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	94.3	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	75.8	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	76.9	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	36.6	20	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3177345)</b>							
ES1325473-001	MB-MW05-3.5	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	85.6	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	85.3	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3177344)</b>							
ES1325473-001	MB-MW05-3.5	EP071: C10 - C14 Fraction	----	640 mg/kg	80.9	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	80.3	53	131



Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report				
				Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3177344) - continued</b>								
ES1325473-001	MB-MW05-3.5	EP071: C29 - C36 Fraction	----	2860 mg/kg	69.5	52	132	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3181456)</b>								
ES1325473-001	MB-MW05-3.5	EP080: C6 - C9 Fraction	----	32.5 mg/kg	115	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3177344)</b>								
ES1325473-001	MB-MW05-3.5	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	101	73	137	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	73.6	53	131	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	53.3	52	132	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3181456)</b>								
ES1325473-001	MB-MW05-3.5	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	113	70	130	
<b>EP080: BTEXN (QCLot: 3181456)</b>								
ES1325473-001	MB-MW05-3.5	EP080: Benzene	71-43-2	2.5 mg/kg	95.4	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	99.4	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	102	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	104	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	105	70	130	
	EP080: Naphthalene	91-20-3		2.5 mg/kg	101	70	130	

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3177344)</b>										
ES1325473-001	MB-MW05-3.5	EP071: C10 - C14 Fraction	----	640 mg/kg	80.9	----	73	137	----	----
		EP071: C15 - C28 Fraction	----	3140 mg/kg	80.3	----	53	131	----	----
		EP071: C29 - C36 Fraction	----	2860 mg/kg	69.5	----	52	132	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3177344)</b>										
ES1325473-001	MB-MW05-3.5	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	101	----	73	137	----	----
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	73.6	----	53	131	----	----
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	53.3	----	52	132	----	----
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3177345)</b>										
ES1325473-001	MB-MW05-3.5	EP075(SIM): Phenol	108-95-2	10 mg/kg	89.5	----	70	130	----	----
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	94.3	----	70	130	----	----
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	75.8	----	60	130	----	----





Sub-Matrix: SOIL

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report							
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
					MS	MSD	Low	High	Value	Control Limit	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3177345) - continued</b>											
ES1325473-001	MB-MW05-3.5	EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	76.9	----	70	130	----	----	
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	36.6	----	20	130	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3177345)</b>											
ES1325473-001	MB-MW05-3.5	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	85.6	----	70	130	----	----	
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	85.3	----	70	130	----	----	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3181226)</b>											
ES1325446-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	103	----	70	130	----	----	
		EG005T: Cadmium	7440-43-9	50 mg/kg	105	----	70	130	----	----	
		EG005T: Chromium	7440-47-3	50 mg/kg	99.1	----	70	130	----	----	
		EG005T: Copper	7440-50-8	125 mg/kg	105	----	70	130	----	----	
		EG005T: Lead	7439-92-1	125 mg/kg	103	----	70	130	----	----	
		EG005T: Nickel	7440-02-0	50 mg/kg	99.6	----	70	130	----	----	
		EG005T: Selenium	7782-49-2	50 mg/kg	109	----	70	130	----	----	
		EG005T: Zinc	7440-66-6	125 mg/kg	91.9	----	70	130	----	----	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3181227)</b>											
ES1325446-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	103	----	70	130	----	----	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3181228)</b>											
ES1325473-009	MK-SB24-2.0	EG005T: Arsenic	7440-38-2	50 mg/kg	115	----	70	130	----	----	
		EG005T: Cadmium	7440-43-9	50 mg/kg	103	----	70	130	----	----	
		EG005T: Chromium	7440-47-3	50 mg/kg	108	----	70	130	----	----	
		EG005T: Copper	7440-50-8	125 mg/kg	111	----	70	130	----	----	
		EG005T: Lead	7439-92-1	125 mg/kg	105	----	70	130	----	----	
		EG005T: Nickel	7440-02-0	50 mg/kg	128	----	70	130	----	----	
		EG005T: Selenium	7782-49-2	50 mg/kg	106	----	70	130	----	----	
		EG005T: Zinc	7440-66-6	250 mg/kg	71.3	----	70	130	----	----	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3181229)</b>											
ES1325473-009	MK-SB24-2.0	EG035T: Mercury	7439-97-6	5 mg/kg	103	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3181456)</b>											
ES1325473-001	MB-MW05-3.5	EP080: C6 - C9 Fraction	----	32.5 mg/kg	115	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3181456)</b>											
ES1325473-001	MB-MW05-3.5	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	113	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3181456)</b>											
ES1325473-001	MB-MW05-3.5	EP080: Benzene	71-43-2	2.5 mg/kg	95.4	----	70	130	----	----	
		EP080: Toluene	108-88-3	2.5 mg/kg	99.4	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	102	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	104	----	70	130	----	----	
		EP080: ortho-Xylene	106-42-3	2.5 mg/kg	105	----	70	130	----	----	



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 Work Order : ES1325473  
 Client : ENVIRO RESOURCES MANAGEMENT  
 Project : PROJECT SYMPHONY - MP



Sub-Matrix: SOIL

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>EP080: BTEXN (QCLot: 3181456) - continued</b>										
ES1325473-001	MB-MW05-3.5	EP080: Naphthalene	91-20-3	2.5 mg/kg	101	----	70	130	----	----

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1325473</b>	Page	: 1 of 6
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
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Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: PROJECT SYMPHONY - MP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 22-NOV-2013
C-O-C number	: ----	Issue Date	: 30-NOV-2013
Sampler	: TS	No. of samples received	: 17
Order number	: 0207423	No. of samples analysed	: 9
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EA055: Moisture Content</b>							
<b>Soil Glass Jar - Unpreserved (EA055-103)</b> MB-MW05-3.5	19-NOV-2013	----	----	----	28-NOV-2013	03-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EA055-103)</b> MB-MW02-3.0, ML-MW07-2.0, MK-SB78-3.9, MK-SB71-1.8, MK-SB44-2.5, MK-SB43-1.6, MK-SB24-2.0, MK-SB30-2.7	20-NOV-2013	----	----	----	28-NOV-2013	04-DEC-2013	✓
<b>EG005T: Total Metals by ICP-AES</b>							
<b>Soil Glass Jar - Unpreserved (EG005T)</b> MB-MW05-3.5	19-NOV-2013	27-NOV-2013	18-MAY-2014	✓	28-NOV-2013	18-MAY-2014	✓
<b>Soil Glass Jar - Unpreserved (EG005T)</b> MB-MW02-3.0, ML-MW07-2.0, MK-SB78-3.9, MK-SB71-1.8, MK-SB44-2.5, MK-SB43-1.6, MK-SB24-2.0, MK-SB30-2.7	20-NOV-2013	27-NOV-2013	19-MAY-2014	✓	28-NOV-2013	19-MAY-2014	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>							
<b>Soil Glass Jar - Unpreserved (EG035T)</b> MB-MW05-3.5	19-NOV-2013	27-NOV-2013	17-DEC-2013	✓	28-NOV-2013	17-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EG035T)</b> MB-MW02-3.0, ML-MW07-2.0, MK-SB78-3.9, MK-SB71-1.8, MK-SB44-2.5, MK-SB43-1.6, MK-SB24-2.0, MK-SB30-2.7	20-NOV-2013	27-NOV-2013	18-DEC-2013	✓	28-NOV-2013	18-DEC-2013	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>							
<b>Soil Glass Jar - Unpreserved (EP071)</b> MB-MW05-3.5	19-NOV-2013	28-NOV-2013	03-DEC-2013	✓	28-NOV-2013	07-JAN-2014	✓
<b>Soil Glass Jar - Unpreserved (EP071)</b> MB-MW02-3.0, ML-MW07-2.0, MK-SB78-3.9, MK-SB71-1.8, MK-SB44-2.5, MK-SB43-1.6, MK-SB24-2.0, MK-SB30-2.7	20-NOV-2013	28-NOV-2013	04-DEC-2013	✓	28-NOV-2013	07-JAN-2014	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP075(SIM)A: Phenolic Compounds</b>							
Soil Glass Jar - Unpreserved (EP075(SIM)) MB-MW05-3.5	19-NOV-2013	28-NOV-2013	03-DEC-2013	✓	28-NOV-2013	07-JAN-2014	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) MB-MW02-3.0, ML-MW07-2.0, MK-SB78-3.9, MK-SB71-1.8, MK-SB44-2.5, MK-SB43-1.6, MK-SB24-2.0, MK-SB30-2.7	20-NOV-2013	28-NOV-2013	04-DEC-2013	✓	28-NOV-2013	07-JAN-2014	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>							
Soil Glass Jar - Unpreserved (EP075(SIM)) MB-MW05-3.5	19-NOV-2013	28-NOV-2013	03-DEC-2013	✓	28-NOV-2013	07-JAN-2014	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) MB-MW02-3.0, ML-MW07-2.0, MK-SB78-3.9, MK-SB71-1.8, MK-SB44-2.5, MK-SB43-1.6, MK-SB24-2.0, MK-SB30-2.7	20-NOV-2013	28-NOV-2013	04-DEC-2013	✓	28-NOV-2013	07-JAN-2014	✓
<b>EP080: BTEXN</b>							
Soil Glass Jar - Unpreserved (EP080) MB-MW05-3.5	19-NOV-2013	28-NOV-2013	03-DEC-2013	✓	29-NOV-2013	03-DEC-2013	✓
Soil Glass Jar - Unpreserved (EP080) MB-MW02-3.0, ML-MW07-2.0, MK-SB78-3.9, MK-SB71-1.8, MK-SB44-2.5, MK-SB43-1.6, MK-SB24-2.0, MK-SB30-2.7	20-NOV-2013	28-NOV-2013	04-DEC-2013	✓	29-NOV-2013	04-DEC-2013	✓
<b>EP080/071: Total Petroleum Hydrocarbons</b>							
Soil Glass Jar - Unpreserved (EP080) MB-MW05-3.5	19-NOV-2013	28-NOV-2013	03-DEC-2013	✓	29-NOV-2013	03-DEC-2013	✓
Soil Glass Jar - Unpreserved (EP080) MB-MW02-3.0, ML-MW07-2.0, MK-SB78-3.9, MK-SB71-1.8, MK-SB44-2.5, MK-SB43-1.6, MK-SB24-2.0, MK-SB30-2.7	20-NOV-2013	28-NOV-2013	04-DEC-2013	✓	29-NOV-2013	04-DEC-2013	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Moisture Content	EA055-103	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	4	38	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	4	38	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	18	11.1	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	38	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	38	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	38	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	38	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	38	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	38	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (2013) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.



## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Duplicate (DUP) RPDs</b>							
EG005T: Total Metals by ICP-AES	ES1325491-054	Anonymous	<b>Chromium</b>	7440-47-3	26.0 %	0-20%	<b>RPD exceeds LOR based limits</b>
EG005T: Total Metals by ICP-AES	ES1325491-054	Anonymous	<b>Copper</b>	7440-50-8	40.0 %	0-20%	<b>RPD exceeds LOR based limits</b>
EG005T: Total Metals by ICP-AES	ES1325491-054	Anonymous	<b>Lead</b>	7439-92-1	35.7 %	0-20%	<b>RPD exceeds LOR based limits</b>
EG005T: Total Metals by ICP-AES	ES1325491-054	Anonymous	<b>Zinc</b>	7440-66-6	21.7 %	0-20%	<b>RPD exceeds LOR based limits</b>

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Laboratory Control outliers occur.
- For all matrices, no Matrix Spike outliers occur.

#### Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- No Analysis Holding Time Outliers exist.

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.

**SAMPLE RECEIPT NOTIFICATION (SRN)****Comprehensive Report**

<b>Work Order</b>	: <b>ES1325473</b>		
<b>Client</b>	: <b>ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: MR JONATHAN LEKAWSKI	<b>Contact</b>	: Barbara Hanna
<b>Address</b>	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: jonathan.lekawski@erm.com	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: PROJECT SYMPHONY - MP	<b>Page</b>	: 1 of 3
<b>Order number</b>	: 0207423		
<b>C-O-C number</b>	: ----	<b>Quote number</b>	: ES2013ENVRES0370 (SY/278/13 V3)
<b>Site</b>	: ----		
<b>Sampler</b>	: TS	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement

**Dates**

<b>Date Samples Received</b>	: 22-NOV-2013	<b>Issue Date</b>	: 25-NOV-2013 15:03
<b>Client Requested Due Date</b>	: 29-NOV-2013	<b>Scheduled Reporting Date</b>	: <b>29-NOV-2013</b>

**Delivery Details**

<b>Mode of Delivery</b>	: Carrier	<b>Temperature</b>	: 12.8°C - Ice bricks present
<b>No. of coolers/boxes</b>	: 1 HARD	<b>No. of samples received</b>	: 17
<b>Security Seal</b>	: Intact.	<b>No. of samples analysed</b>	: 9

**General Comments**

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.





### Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

### Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL	No analysis requested	SOIL - EG005T (solids)	Total Metals by ICP-AES	SOIL - S-27	TRH/BTEXN/PAH/Phenols&Metals
ES1325473-001	19-NOV-2013 15:00	MB-MW05-3.5			✓		✓	
ES1325473-002	20-NOV-2013 15:00	MB-MW02-3.0			✓		✓	
ES1325473-003	20-NOV-2013 15:00	ML-MW07-2.0			✓		✓	
ES1325473-004	20-NOV-2013 15:00	MK-SB78-3.9			✓		✓	
ES1325473-005	20-NOV-2013 15:00	MK-SB79-2.9	✓					
ES1325473-006	20-NOV-2013 15:00	MK-SB71-1.8			✓		✓	
ES1325473-007	20-NOV-2013 15:00	MK-SB44-2.5			✓		✓	
ES1325473-008	20-NOV-2013 15:00	MK-SB43-1.6			✓		✓	
ES1325473-009	20-NOV-2013 15:00	MK-SB24-2.0			✓		✓	
ES1325473-010	20-NOV-2013 15:00	MK-SB30-2.7			✓		✓	
ES1325473-011	19-NOV-2013 15:00	MB-MW05-2.1	✓					
ES1325473-012	19-NOV-2013 15:00	MB-MW05-4.9	✓					
ES1325473-013	20-NOV-2013 15:00	MB-MW02-1.2	✓					
ES1325473-014	20-NOV-2013 15:00	MB-MW02-6.4	✓					
ES1325473-015	20-NOV-2013 15:00	ML-MW07-3.2	✓					
ES1325473-016	20-NOV-2013 15:00	MK-SB78-4.4	✓					
ES1325473-017	20-NOV-2013 15:00	MK-SB24-2.8	✓					

### Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



## *Requested Deliverables*

### **ALL INVOICES**

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### **MR JONATHAN LEKAWSKI**

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com

### **SYMPHONY DELTAWEST**

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com

### **THE ACCOUNTS PAYABLE**

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com





# CHAIN OF CUSTODY

ALS Laboratory  
please tick →

Client: ERM  
Office: Sydney  
Project: Project Symphony - MP  
Order Number: 0207423

Project Manager: Jonathan Lekawski  
SAMPLER: TIAVONE SHAW Gavin Powell  
COC emailed to **ALERT YES** **NO**  
Email Reports to (will default to PM if no other addresses are listed): Symphony.DeliverWest@erm.com

Relinquished By: **Therese Shaw**  
Date/Time: **21/10/13 1630**

Received By: \_\_\_\_\_  
Date/Time: \_\_\_\_\_

TURNAROUND REQUIREMENTS:  Standard TAT (List due date): \_\_\_\_\_  
 Non Standard or urgent TAT (List due date): \_\_\_\_\_  
(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)

ALS QUOTE NO.: SYZ/27/13  
COC SEQUENCE NUMBER (Circle):  
COC: 1 (2) 3 4 5 6 7  
OF: 1 2 3 4 5 6 7  
Other comments: \_\_\_\_\_

FOR LABORATORY USE ONLY (Circle)  
Custody Seal Intact? Yes No N/A  
Free Ice / frozen Ice chips present upon receipt? Yes No N/A  
Random Sample Temperature on Receipt: \_\_\_\_\_ °C

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: \_\_\_\_\_

ALS USE	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below	TOTAL CONTAINERS	ANALYSIS REQUIRED INCLUDING SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify total (unfiltered bottle required) or Dissolved (field filtered bottle required).										Additional Information		
						S-27 (8 metals - As, Cd, Cr, Cu, Ni, Pb, Zn, Hg, TRH/BTEX, PAH/Phenols)	Additional Metal - Se	TRH / BTEX / PAH / Phenol	Asbestos	VOC Scan	PCB	Particle Sizing (hydrometer), TOC -	pH, Exchangeable Cations plus ECEC					
	6	20.11.13	Soil	1 jar	1	X	X	X										
	7			"	1	X	X	X										
	8			"	1	X	X	X										
	9			"	1	X	X	X										
	10			"	1	X	X	X										How

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airflight Unpreserved Plastic  
V = VOA Vial /CO Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VB8 = VOA Vial Sulfuric Preserved; AV = Airflight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speedation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;  
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Solids; B = Unpreserved Bag.

## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>ES1325783</b> <b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : MR JONATHAN LEKAWSKI <b>Address</b> : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007  <b>E-mail</b> : jonathan.lekawski@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800 <b>Project</b> : PROJECT SYMPHONY - MP <b>Order number</b> : 0207423 <b>C-O-C number</b> : ---- <b>Sampler</b> : TS, GP <b>Site</b> : ----  <b>Quote number</b> : SY/278/13 V3	<b>Page</b> : 1 of 13  <b>Laboratory</b> : Environmental Division Sydney <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164  <b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555 <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement  <b>Date Samples Received</b> : 27-NOV-2013 <b>Issue Date</b> : 04-DEC-2013  <b>No. of samples received</b> : 19 <b>No. of samples analysed</b> : 10
--	--

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits



NATA Accredited Laboratory 825  
 Accredited for compliance with  
 ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EP080: The TRIP SPIKE and TRIP SPIKE CONTROL have been analysed for volatile TPH and BTEX only. The TRIP SPIKE and TRIP SPIKE CONTROL were prepared in the lab using reagent grade sand spiked with petrol. The TRIP SPIKE was dispatched from the lab and the TRIP SPIKE CONTROL retained. The spike samples were extracted and analysed concurrently with samples reported in this batch.**



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB42_3.5	ME_MW04_2.5	MI_SB03_2.8	MI_SB06_1.4	MK_SB65_3.5
				21-NOV-2013 15:00	21-NOV-2013 15:00	21-NOV-2013 15:00	21-NOV-2013 15:00	22-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325783-001	ES1325783-002	ES1325783-004	ES1325783-005	ES1325783-006
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	21.4	20.5	14.4	27.3	18.4
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	12	21	35	21	27
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	10	11	15	9	12
Copper	7440-50-8	5	mg/kg	10	22	12	15	11
Lead	7439-92-1	5	mg/kg	18	24	23	30	20
Nickel	7440-02-0	2	mg/kg	5	44	18	74	43
Zinc	7440-66-6	5	mg/kg	16	78	47	128	80
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	0.1	mg/kg	----	----	----	----	<0.1
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	----	----	----	----	<0.5
Isopropylbenzene	98-82-8	0.5	mg/kg	----	----	----	----	<0.5
n-Propylbenzene	103-65-1	0.5	mg/kg	----	----	----	----	<0.5
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	----	----	----	----	<0.5
sec-Butylbenzene	135-98-8	0.5	mg/kg	----	----	----	----	<0.5
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	----	----	----	----	<0.5
tert-Butylbenzene	98-06-6	0.5	mg/kg	----	----	----	----	<0.5
p-Isopropyltoluene	99-87-6	0.5	mg/kg	----	----	----	----	<0.5
n-Butylbenzene	104-51-8	0.5	mg/kg	----	----	----	----	<0.5
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	----	----	----	----	<5
2-Butanone (MEK)	78-93-3	5	mg/kg	----	----	----	----	<5
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	----	----	----	----	<5
2-Hexanone (MBK)	591-78-6	5	mg/kg	----	----	----	----	<5
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	----	----	----	----	<0.5
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	----	----	----	----	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB42_3.5	ME_MW04_2.5	MI_SB03_2.8	MI_SB06_1.4	MK_SB65_3.5
				21-NOV-2013 15:00	21-NOV-2013 15:00	21-NOV-2013 15:00	21-NOV-2013 15:00	22-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325783-001	ES1325783-002	ES1325783-004	ES1325783-005	ES1325783-006
<b>EP074D: Fumigants - Continued</b>								
1.2-Dichloropropane	78-87-5	0.5	mg/kg	----	----	----	----	<0.5
cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	----	----	----	----	<0.5
trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	----	----	----	----	<0.5
1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	----	----	----	----	<0.5
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	----	----	----	----	<5
Chloromethane	74-87-3	5	mg/kg	----	----	----	----	<5
Vinyl chloride	75-01-4	5	mg/kg	----	----	----	----	<5
Bromomethane	74-83-9	5	mg/kg	----	----	----	----	<5
Chloroethane	75-00-3	5	mg/kg	----	----	----	----	<5
Trichlorofluoromethane	75-69-4	5	mg/kg	----	----	----	----	<5
1.1-Dichloroethene	75-35-4	0.5	mg/kg	----	----	----	----	<0.5
Iodomethane	74-88-4	0.5	mg/kg	----	----	----	----	<0.5
trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	----	----	----	----	<0.5
1.1-Dichloroethane	75-34-3	0.5	mg/kg	----	----	----	----	<0.5
cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	----	----	----	----	<0.5
1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	----	----	----	----	<0.5
1.1-Dichloropropylene	563-58-6	0.5	mg/kg	----	----	----	----	<0.5
Carbon Tetrachloride	56-23-5	0.5	mg/kg	----	----	----	----	<0.5
1.2-Dichloroethane	107-06-2	0.5	mg/kg	----	----	----	----	<0.5
Trichloroethene	79-01-6	0.5	mg/kg	----	----	----	----	<0.5
Dibromomethane	74-95-3	0.5	mg/kg	----	----	----	----	<0.5
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	----	----	----	----	<0.5
1.3-Dichloropropane	142-28-9	0.5	mg/kg	----	----	----	----	<0.5
Tetrachloroethene	127-18-4	0.5	mg/kg	----	----	----	----	<0.5
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	----	----	----	----	<0.5
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	----	----	----	----	<0.5
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	----	----	----	----	<0.5
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	----	----	----	----	<0.5
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	----	----	----	----	<0.5
Pentachloroethane	76-01-7	0.5	mg/kg	----	----	----	----	<0.5
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	----	----	----	----	<0.5
Hexachlorobutadiene	87-68-3	0.5	mg/kg	----	----	----	----	<0.5





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB42_3.5	ME_MW04_2.5	MI_SB03_2.8	MI_SB06_1.4	MK_SB65_3.5
				21-NOV-2013 15:00	21-NOV-2013 15:00	21-NOV-2013 15:00	21-NOV-2013 15:00	22-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325783-001	ES1325783-002	ES1325783-004	ES1325783-005	ES1325783-006
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	----	----	----	----	<0.5
Bromobenzene	108-86-1	0.5	mg/kg	----	----	----	----	<0.5
2-Chlorotoluene	95-49-8	0.5	mg/kg	----	----	----	----	<0.5
4-Chlorotoluene	106-43-4	0.5	mg/kg	----	----	----	----	<0.5
1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	----	----	----	----	<0.5
1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	----	----	----	----	<0.5
1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	----	----	----	----	<0.5
1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	----	----	----	----	<0.5
1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	----	----	----	----	<0.5
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	----	----	----	----	<0.5
Bromodichloromethane	75-27-4	0.5	mg/kg	----	----	----	----	<0.5
Dibromochloromethane	124-48-1	0.5	mg/kg	----	----	----	----	<0.5
Bromoform	75-25-2	0.5	mg/kg	----	----	----	----	<0.5
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	5	mg/kg	----	----	----	----	<5
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB42_3.5	ME_MW04_2.5	MI_SB03_2.8	MI_SB06_1.4	MK_SB65_3.5
				21-NOV-2013 15:00	21-NOV-2013 15:00	21-NOV-2013 15:00	21-NOV-2013 15:00	22-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325783-001	ES1325783-002	ES1325783-004	ES1325783-005	ES1325783-006
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080: BTEXN</b>								



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB42_3.5	ME_MW04_2.5	MI_SB03_2.8	MI_SB06_1.4	MK_SB65_3.5
				21-NOV-2013 15:00	21-NOV-2013 15:00	21-NOV-2013 15:00	21-NOV-2013 15:00	22-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325783-001	ES1325783-002	ES1325783-004	ES1325783-005	ES1325783-006
<b>EP080: BTEXN - Continued</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	----	----	----	----	113
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	----	----	----	95.3
Toluene-D8	2037-26-5	0.1	%	----	----	----	----	113
4-Bromofluorobenzene	460-00-4	0.1	%	----	----	----	----	100
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	111	104	103	104	101
2-Chlorophenol-D4	93951-73-6	0.1	%	109	105	110	114	106
2,4,6-Tribromophenol	118-79-6	0.1	%	104	100	97.0	99.8	91.6
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	110	106	106	108	102
Anthracene-d10	1719-06-8	0.1	%	95.4	92.8	93.0	94.9	89.4
4-Terphenyl-d14	1718-51-0	0.1	%	96.3	92.4	91.8	94.2	88.7
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	71.5	83.8	105	91.2	86.8
Toluene-D8	2037-26-5	0.1	%	93.4	95.7	94.9	99.9	105
4-Bromofluorobenzene	460-00-4	0.1	%	106	87.4	83.4	104	98.6



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				MA_MW01_2.6	MA_MW07_3.0	TRIP BLANK	TRIP SPIKE	TSC
				22-NOV-2013 15:00	25-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325783-007	ES1325783-008	ES1325783-009	ES1325783-010	ES1325783-011
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	22.2	20.2	----	----	----
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	----	----	----
Arsenic	7440-38-2	5	mg/kg	17	9	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	17	12	----	----	----
Copper	7440-50-8	5	mg/kg	14	18	----	----	----
Lead	7439-92-1	5	mg/kg	49	24	----	----	----
Nickel	7440-02-0	2	mg/kg	22	33	----	----	----
Zinc	7440-66-6	5	mg/kg	70	56	----	----	----
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	----	----
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	----	----	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	----	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	----	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	----	----	----
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	----	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	----	----	----
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	----	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	----	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	----	----	----
n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	----	----	----
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	----	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	----	----	----
2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	----	----	----
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	----	----	----
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	----	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MA_MW01_2.6	MA_MW07_3.0	TRIP BLANK	TRIP SPIKE	TSC
				22-NOV-2013 15:00	25-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325783-007	ES1325783-008	ES1325783-009	ES1325783-010	ES1325783-011
<b>EP074D: Fumigants - Continued</b>								
1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	----	----	----
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	----	----	----
Chloromethane	74-87-3	5	mg/kg	<5	<5	----	----	----
Vinyl chloride	75-01-4	5	mg/kg	<5	<5	----	----	----
Bromomethane	74-83-9	5	mg/kg	<5	<5	----	----	----
Chloroethane	75-00-3	5	mg/kg	<5	<5	----	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	----	----	----
1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	----	----	----
Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	----	----	----
trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	----	----	----
1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	----	----	----
cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	----	----	----
1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	----	----	----
1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	----	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	----	----	----
1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	----	----	----
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	----	----	----
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	----	----	----
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	----	----	----
1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	----	----	----
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	----	----	----
Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	----	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MA_MW01_2.6	MA_MW07_3.0	TRIP BLANK	TRIP SPIKE	TSC
				22-NOV-2013 15:00	25-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325783-007	ES1325783-008	ES1325783-009	ES1325783-010	ES1325783-011
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	----	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	----	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	----	----	----
1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	----	----	----
1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	----	----	----
1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	----	----	----
1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	----	----	----
1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	----	----	----
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	----	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	----	----	----
Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	----	----	----
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	5	mg/kg	<5	<5	----	----	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	----	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	----	----	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	----	----	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	----	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	----	----	----
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	----	----	----
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	----	----	----
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	----	----	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	----	----	----
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	----	----	----
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	----	----	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	----	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	----	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MA_MW01_2.6	MA_MW07_3.0	TRIP BLANK	TRIP SPIKE	TSC
				22-NOV-2013 15:00	25-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325783-007	ES1325783-008	ES1325783-009	ES1325783-010	ES1325783-011
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	----	----	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	----	----	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<b>51</b>	<b>65</b>
C10 - C14 Fraction	----	50	mg/kg	<50	<50	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	----	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<b>61</b>	<b>80</b>
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<b>35</b>	<b>48</b>
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	----	----	----
<b>EP080: BTEXN</b>								



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MA_MW01_2.6	MA_MW07_3.0	TRIP BLANK	TRIP SPIKE	TSC
				22-NOV-2013 15:00	25-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325783-007	ES1325783-008	ES1325783-009	ES1325783-010	ES1325783-011
<b>EP080: BTEXN - Continued</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	0.4	0.6
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	12.5	15.1
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	1.8	2.1
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	8.3	9.9
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	3.4	4.0
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	26.4	31.7
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	11.7	13.9
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	90.1	74.7	----	----	----
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	113	109	----	----	----
Toluene-D8	2037-26-5	0.1	%	115	112	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	106	101	----	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	97.6	111	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	98.6	110	----	----	----
2,4,6-Tribromophenol	118-79-6	0.1	%	98.0	95.6	----	----	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	98.7	105	----	----	----
Anthracene-d10	1719-06-8	0.1	%	86.6	91.2	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	86.8	91.8	----	----	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	101	99.2	98.2	88.3	91.4
Toluene-D8	2037-26-5	0.1	%	107	104	109	101	88.3
4-Bromofluorobenzene	460-00-4	0.1	%	102	98.5	108	92.6	94.9





## Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP066S: PCB Surrogate</b>			
Decachlorobiphenyl	2051-24-3	39	149
<b>EP074S: VOC Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	64	130
Toluene-D8	2037-26-5	66	136
4-Bromofluorobenzene	460-00-4	60	122
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

## QUALITY CONTROL REPORT

<b>Work Order</b>	: <b>ES1325783</b>	Page	: 1 of 16
<b>Client</b>	: <b>ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: MR JONATHAN LEKAWSKI	<b>Contact</b>	: Barbara Hanna
<b>Address</b>	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: jonathan.lekawski@erm.com	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: PROJECT SYMPHONY - MP	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b>	: ----	<b>Date Samples Received</b>	: 27-NOV-2013
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: 04-DEC-2013
<b>Sampler</b>	: TS, GP	<b>No. of samples received</b>	: 19
<b>Order number</b>	: 0207423	<b>No. of samples analysed</b>	: 10
<b>Quote number</b>	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

### *Signatories*

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

#### *Signatories*

Celine Conceicao  
Pabi Subba

#### *Position*

Senior Spectroscopist  
Senior Organic Chemist

#### *Accreditation Category*

Sydney Inorganics  
Sydney Organics



### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :  
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
RPD = Relative Percentage Difference  
# = Indicates failed QC



## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EA055: Moisture Content (QC Lot: 3189039)</b>									
EB1328649-003	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	<1.0	<1.0	0.0	No Limit
ES1325772-002	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	15.7	17.0	7.8	0% - 50%
<b>EA055: Moisture Content (QC Lot: 3189040)</b>									
ES1325783-005	MI_SB06_1.4	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	27.3	30.6	11.4	0% - 20%
ES1325826-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	18.0	20.8	14.9	0% - 20%
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3189338)</b>									
ES1325779-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	18	18	0.0	0% - 50%
		EG005T: Chromium	7440-47-3	2	mg/kg	56	56	0.0	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	10	11	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	27	28	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	292	322	9.8	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	197	240	19.5	0% - 20%
ES1325782-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	14	14	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	19	16	19.1	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	24	23	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	21	22	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	13	13	0.0	No Limit
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3189340)</b>									
ES1325783-002	ME_MW04_2.5	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	11	12	8.8	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	44	42	3.4	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	21	23	12.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	22	18	21.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	24	23	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	78	78	0.0	0% - 50%
ES1326040-005	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	2	2	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	23	22	4.6	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	18	16	13.4	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	17	20	14.6	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	50	60	18.4	0% - 50%



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3189340) - continued</b>									
ES1326040-005	Anonymous	EG005T: Lead	7439-92-1	5	mg/kg	126	153	19.4	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	501	462	8.2	0% - 20%
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3189339)</b>									
ES1325779-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1325782-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3189341)</b>									
ES1325783-002	ME_MW04_2.5	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1326040-005	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 3190624)</b>									
ES1325880-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1325886-004	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3187235)</b>									
ES1325783-006	MK_SB65_3.5	EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074B: Oxygenated Compounds (QC Lot: 3187235)</b>									
ES1325783-006	MK_SB65_3.5	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.0	No Limit
<b>EP074C: Sulfonated Compounds (QC Lot: 3187235)</b>									
ES1325783-006	MK_SB65_3.5	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074D: Fumigants (QC Lot: 3187235)</b>									
ES1325783-006	MK_SB65_3.5	EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3187235)</b>									
ES1325783-006	MK_SB65_3.5	EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3187235) - continued</b>									
ES1325783-006	MK_SB65_3.5	EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.0	No Limit
EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.0	No Limit		
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.0	No Limit		
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3187235)</b>									
ES1325783-006	MK_SB65_3.5	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074G: Trihalomethanes (QC Lot: 3187235)</b>									
ES1325783-006	MK_SB65_3.5	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074H: Naphthalene (QC Lot: 3187235)</b>									
ES1325783-006	MK_SB65_3.5	EP074: Naphthalene	91-20-3	5	mg/kg	<5	<5	0.0	No Limit
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3187750)</b>									
ES1325782-001	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
		ES1325783-002	ME_MW04_2.5	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5
EP075(SIM): 2-Chlorophenol	95-57-8			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2-Methylphenol	95-48-7			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2-Nitrophenol	88-75-5			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2.4-Dimethylphenol	105-67-9			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2.4-Dichlorophenol	120-83-2			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2.6-Dichlorophenol	87-65-0			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4			0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): 3- & 4-Methylphenol	1319-77-3			1	mg/kg	<1	<1	0.0	No Limit
EP075(SIM): Pentachlorophenol	87-86-5			2	mg/kg	<2	<2	0.0	No Limit
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3187750)</b>									
ES1325782-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3187750) - continued</b>									
ES1325782-001	Anonymous	EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1325783-002	ME_MW04_2.5	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3187234)</b>									
ES1325783-006	MK_SB65_3.5	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1325886-003	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3187749)</b>									
ES1325782-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1325783-002	ME_MW04_2.5	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3187234)</b>									
ES1325783-006	MK_SB65_3.5	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES1325886-003	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3187749)</b>									
ES1325782-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit





Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3187749) - continued</b>									
ES1325782-001	Anonymous	EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
ES1325783-002	ME_MW04_2.5	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3187234)</b>									
ES1325783-006	MK_SB65_3.5	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES1325886-003	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit



## Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3189338)</b>								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	120	87	129
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	105	80	122
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	127	71	133
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	118	86	128
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	115	81	123
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	122	84	130
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	106	75	131
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	117	81	133
<b>EG005T: Total Metals by ICP-AES (QCLot: 3189340)</b>								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	118	87	129
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	108	80	122
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	127	71	133
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	114	86	128
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	121	81	123
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	123	84	130
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	129	75	131
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	126	81	133
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3189339)</b>								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	73.4	66	112
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3189341)</b>								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	71.5	66	112
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3190624)</b>								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	85.0	57.4	117
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3187235)</b>								
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	102	64	126
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	104	66	128
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	111	63	129
EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	113	63	129
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	112	64	130
EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	113	63	129
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	112	63	129
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	113	62	130
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	112	61	131
<b>EP074B: Oxygenated Compounds (QCLot: 3187235)</b>								



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074B: Oxygenated Compounds (QCLot: 3187235) - continued</b>									
EP074: Vinyl Acetate	108-05-4	1	mg/kg	----	10 mg/kg	100	29.6	156	
		5	mg/kg	<5	----	----	----	----	
EP074: 2-Butanone (MEK)	78-93-3	1	mg/kg	----	10 mg/kg	92.7	58	136	
		5	mg/kg	<5	----	----	----	----	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	1	mg/kg	----	10 mg/kg	98.2	54	138	
		5	mg/kg	<5	----	----	----	----	
EP074: 2-Hexanone (MBK)	591-78-6	1	mg/kg	----	10 mg/kg	99.3	54	136	
		5	mg/kg	<5	----	----	----	----	
<b>EP074C: Sulfonated Compounds (QCLot: 3187235)</b>									
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	97.5	54	126	
<b>EP074D: Fumigants (QCLot: 3187235)</b>									
EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	92.1	55	133	
EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	102	69	127	
EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	106	54	124	
EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	101	51	125	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	101	66	126	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3187235)</b>									
EP074: Dichlorodifluoromethane	75-71-8	1	mg/kg	----	10 mg/kg	112	30	148	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloromethane	74-87-3	1	mg/kg	----	10 mg/kg	110	41	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Vinyl chloride	75-01-4	1	mg/kg	----	10 mg/kg	107	43	147	
		5	mg/kg	<5	----	----	----	----	
EP074: Bromomethane	74-83-9	1	mg/kg	----	10 mg/kg	105	47	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloroethane	75-00-3	1	mg/kg	----	10 mg/kg	107	49	143	
		5	mg/kg	<5	----	----	----	----	
EP074: Trichlorofluoromethane	75-69-4	1	mg/kg	----	10 mg/kg	108	49	135	
		5	mg/kg	<5	----	----	----	----	
EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	101	54	126	
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	103	43	129	
EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	105	62	130	
EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	104	66	132	
EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	105	66	132	
EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	91.3	62	126	
EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	104	64	128	
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	102	59	125	
EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	106	65	123	
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	103	64	120	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3187235) - continued</b>									
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	98.0	65	127	
EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	108	70	130	
EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	101	72	128	
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	101	67	143	
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	93.3	62	122	
EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	99.4	54	128	
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	95.4	55	129	
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	97.7	56	132	
EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	107	65	135	
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	112	19.8	134	
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	93.6	53	129	
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	115	48	136	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3187235)</b>									
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	103	70	128	
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	111	67	127	
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	111	64	130	
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	113	62	130	
EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	111	63	129	
EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	108	63	129	
EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	108	66	128	
EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	114	54	134	
EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	114	60	132	
<b>EP074G: Trihalomethanes (QCLot: 3187235)</b>									
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	97.8	62	120	
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	99.4	61	121	
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	98.7	63	121	
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	104	60	126	
<b>EP074H: Naphthalene (QCLot: 3187235)</b>									
EP074: Naphthalene	91-20-3	0.5	mg/kg	----	1 mg/kg	108	63	133	
		5	mg/kg	<5	----	----	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3187750)</b>									
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	111	74	116	
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	112	74	116	
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	98.7	72	116	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	107	69	123	
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	92.8	60.3	117	
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	100	69	117	
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	101	68	112	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3187750) - continued</b>									
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	102	73	117	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	92.7	76.4	114	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	83.6	57	111	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	86.3	68.9	112	
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	20.0	3.9	57	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3187750)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	112	80	124	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	105	77	123	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	107	79	123	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	106	77	123	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	105	79	123	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	101	79	123	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	98.8	79	123	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	101	79	125	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	103	73	121	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	112	81	123	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	87.6	70	118	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	105	77	123	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	113	76	122	
EP075(SIM): Indeno(1,2,3-cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	107	71	113	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	105	71.7	113	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	105	72.4	114	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3187234)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	122	68.4	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3187749)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	84.6	71	131	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	96.2	74	138	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	99.6	64	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3187234)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	124	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3187749)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	86.3	70	130	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	100	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	
		50	mg/kg	----	150 mg/kg	118	63	131	
<b>EP080: BTEXN (QCLot: 3187234)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	107	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	123	62	128	



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit		Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High
<b>EP080: BTEXN (QCLot: 3187234) - continued</b>								
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	107	58	118
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	116	60	120
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	106	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	96.9	62	138

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%) Low High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3189338)</b>							
ES1325779-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	107	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	102	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	88.9	70	130
		EG005T: Copper	7440-50-8	125 mg/kg	107	70	130
		EG005T: Lead	7439-92-1	125 mg/kg	120	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	104	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	109	70	130
		EG005T: Zinc	7440-66-6	125 mg/kg	94.8	70	130
<b>EG005T: Total Metals by ICP-AES (QCLot: 3189340)</b>							
ES1325783-002	ME_MW04_2.5	EG005T: Arsenic	7440-38-2	50 mg/kg	120	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	110	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	101	70	130
		EG005T: Copper	7440-50-8	125 mg/kg	108	70	130
		EG005T: Lead	7439-92-1	125 mg/kg	114	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	115	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	115	70	130
		EG005T: Zinc	7440-66-6	125 mg/kg	104	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3189339)</b>							
ES1325779-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	82.8	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3189341)</b>							
ES1325783-002	ME_MW04_2.5	EG035T: Mercury	7439-97-6	5 mg/kg	87.8	70	130
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3190624)</b>							
ES1325880-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	82.0	70	130



Sub-Matrix: SOIL

				Matrix Spike (MS) Report				
				Spike	SpikeRecovery(%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3187235)</b>								
ES1325783-006	MK_SB65_3.5	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	99.5	70	130	
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	89.8	70	130	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3187235)</b>								
ES1325783-006	MK_SB65_3.5	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	91.2	70	130	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3187750)</b>								
ES1325782-001	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	106	70	130	
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	104	70	130	
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	101	60	130	
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	112	70	130	
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	46.0	20	130	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3187750)</b>								
ES1325782-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	119	70	130	
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	110	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3187234)</b>								
ES1325783-006	MK_SB65_3.5	EP080: C6 - C9 Fraction	----	32.5 mg/kg	117	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3187749)</b>								
ES1325782-001	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	77.4	73	137	
		EP071: C15 - C28 Fraction	----	3140 mg/kg	81.3	53	131	
		EP071: C29 - C36 Fraction	----	2860 mg/kg	73.3	52	132	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3187234)</b>								
ES1325783-006	MK_SB65_3.5	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	119	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3187749)</b>								
ES1325782-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	99.6	73	137	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	76.1	53	131	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	58.6	52	132	
<b>EP080: BTEXN (QCLot: 3187234)</b>								
ES1325783-006	MK_SB65_3.5	EP080: Benzene	71-43-2	2.5 mg/kg	93.6	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	96.0	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	118	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	97.3	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	101	70	130	
	EP080: Naphthalene	91-20-3	2.5 mg/kg	85.4	70	130		

**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report**





The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
					MS	MSD	Low	High	Value	Control Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3187234)</b>											
ES1325783-006	MK_SB65_3.5	EP080: C6 - C9 Fraction	----	32.5 mg/kg	117	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3187234)</b>											
ES1325783-006	MK_SB65_3.5	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	119	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3187234)</b>											
ES1325783-006	MK_SB65_3.5	EP080: Benzene	71-43-2	2.5 mg/kg	93.6	----	70	130	----	----	
		EP080: Toluene	108-88-3	2.5 mg/kg	96.0	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	118	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	97.3	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	101	----	70	130	----	----	
		EP080: Naphthalene	91-20-3	2.5 mg/kg	85.4	----	70	130	----	----	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3187235)</b>											
ES1325783-006	MK_SB65_3.5	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	99.5	----	70	130	----	----	
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	89.8	----	70	130	----	----	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3187235)</b>											
ES1325783-006	MK_SB65_3.5	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	91.2	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3187749)</b>											
ES1325782-001	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	77.4	----	73	137	----	----	
		EP071: C15 - C28 Fraction	----	3140 mg/kg	81.3	----	53	131	----	----	
		EP071: C29 - C36 Fraction	----	2860 mg/kg	73.3	----	52	132	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3187749)</b>											
ES1325782-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	99.6	----	73	137	----	----	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	76.1	----	53	131	----	----	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	58.6	----	52	132	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3187750)</b>											
ES1325782-001	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	106	----	70	130	----	----	
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	104	----	70	130	----	----	
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	101	----	60	130	----	----	
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	112	----	70	130	----	----	
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	46.0	----	20	130	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3187750)</b>											
ES1325782-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	119	----	70	130	----	----	
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	110	----	70	130	----	----	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3189338)</b>											
ES1325779-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	107	----	70	130	----	----	
		EG005T: Cadmium	7440-43-9	50 mg/kg	102	----	70	130	----	----	





Sub-Matrix: SOIL

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>EG005T: Total Metals by ICP-AES (QCLot: 3189338) - continued</b>										
ES1325779-001	Anonymous	EG005T: Chromium	7440-47-3	50 mg/kg	88.9	----	70	130	----	----
		EG005T: Copper	7440-50-8	125 mg/kg	107	----	70	130	----	----
		EG005T: Lead	7439-92-1	125 mg/kg	120	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	104	----	70	130	----	----
		EG005T: Selenium	7782-49-2	50 mg/kg	109	----	70	130	----	----
		EG005T: Zinc	7440-66-6	125 mg/kg	94.8	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3189339)</b>										
ES1325779-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	82.8	----	70	130	----	----
<b>EG005T: Total Metals by ICP-AES (QCLot: 3189340)</b>										
ES1325783-002	ME_MW04_2.5	EG005T: Arsenic	7440-38-2	50 mg/kg	120	----	70	130	----	----
		EG005T: Cadmium	7440-43-9	50 mg/kg	110	----	70	130	----	----
		EG005T: Chromium	7440-47-3	50 mg/kg	101	----	70	130	----	----
		EG005T: Copper	7440-50-8	125 mg/kg	108	----	70	130	----	----
		EG005T: Lead	7439-92-1	125 mg/kg	114	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	115	----	70	130	----	----
		EG005T: Selenium	7782-49-2	50 mg/kg	115	----	70	130	----	----
		EG005T: Zinc	7440-66-6	125 mg/kg	104	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3189341)</b>										
ES1325783-002	ME_MW04_2.5	EG035T: Mercury	7439-97-6	5 mg/kg	87.8	----	70	130	----	----
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3190624)</b>										
ES1325880-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	82.0	----	70	130	----	----

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1325783</b>	Page	: 1 of 9
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: PROJECT SYMPHONY - MP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 27-NOV-2013
C-O-C number	: ----	Issue Date	: 04-DEC-2013
Sampler	: TS, GP	No. of samples received	: 19
Order number	: 0207423	No. of samples analysed	: 10
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EA055: Moisture Content</b>								
Soil Glass Jar - Unpreserved (EA055-103) MK_SB42_3.5, MI_SB03_2.8,	ME_MW04_2.5, MI_SB06_1.4	21-NOV-2013	----	----	----	02-DEC-2013	05-DEC-2013	✓
Soil Glass Jar - Unpreserved (EA055-103) MK_SB65_3.5,	MA_MW01_2.6	22-NOV-2013	----	----	----	02-DEC-2013	06-DEC-2013	✓
Soil Glass Jar - Unpreserved (EA055-103) MA_MW07_3.0		25-NOV-2013	----	----	----	02-DEC-2013	09-DEC-2013	✓
<b>EG005T: Total Metals by ICP-AES</b>								
Soil Glass Jar - Unpreserved (EG005T) MK_SB42_3.5, MI_SB03_2.8,	ME_MW04_2.5, MI_SB06_1.4	21-NOV-2013	02-DEC-2013	20-MAY-2014	✓	03-DEC-2013	20-MAY-2014	✓
Soil Glass Jar - Unpreserved (EG005T) MK_SB65_3.5,	MA_MW01_2.6	22-NOV-2013	02-DEC-2013	21-MAY-2014	✓	03-DEC-2013	21-MAY-2014	✓
Soil Glass Jar - Unpreserved (EG005T) MA_MW07_3.0		25-NOV-2013	02-DEC-2013	24-MAY-2014	✓	03-DEC-2013	24-MAY-2014	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Soil Glass Jar - Unpreserved (EG035T) MK_SB42_3.5, MI_SB03_2.8,	ME_MW04_2.5, MI_SB06_1.4	21-NOV-2013	02-DEC-2013	19-DEC-2013	✓	04-DEC-2013	19-DEC-2013	✓
Soil Glass Jar - Unpreserved (EG035T) MK_SB65_3.5,	MA_MW01_2.6	22-NOV-2013	02-DEC-2013	20-DEC-2013	✓	04-DEC-2013	20-DEC-2013	✓
Soil Glass Jar - Unpreserved (EG035T) MA_MW07_3.0		25-NOV-2013	02-DEC-2013	23-DEC-2013	✓	04-DEC-2013	23-DEC-2013	✓
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Soil Glass Jar - Unpreserved (EP066) MK_SB65_3.5,	MA_MW01_2.6	22-NOV-2013	03-DEC-2013	06-DEC-2013	✓	03-DEC-2013	12-JAN-2014	✓
Soil Glass Jar - Unpreserved (EP066) MA_MW07_3.0		25-NOV-2013	03-DEC-2013	09-DEC-2013	✓	03-DEC-2013	12-JAN-2014	✓



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
<b>Soil Glass Jar - Unpreserved (EP071)</b> MK_SB42_3.5, ME_MW04_2.5, MI_SB03_2.8, MI_SB06_1.4	21-NOV-2013	02-DEC-2013	05-DEC-2013	✔	03-DEC-2013	11-JAN-2014	✔	
<b>Soil Glass Jar - Unpreserved (EP071)</b> MK_SB65_3.5, MA_MW01_2.6	22-NOV-2013	02-DEC-2013	06-DEC-2013	✔	03-DEC-2013	11-JAN-2014	✔	
<b>Soil Glass Jar - Unpreserved (EP071)</b> MA_MW07_3.0	25-NOV-2013	02-DEC-2013	09-DEC-2013	✔	03-DEC-2013	11-JAN-2014	✔	
<b>EP074D: Fumigants</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB65_3.5, MA_MW01_2.6	22-NOV-2013	02-DEC-2013	29-NOV-2013	✖	02-DEC-2013	29-NOV-2013	✖	
<b>Soil Glass Jar - Unpreserved (EP074)</b> MA_MW07_3.0	25-NOV-2013	02-DEC-2013	02-DEC-2013	✔	02-DEC-2013	02-DEC-2013	✔	
<b>EP074E: Halogenated Aliphatic Compounds</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB65_3.5, MA_MW01_2.6	22-NOV-2013	02-DEC-2013	29-NOV-2013	✖	02-DEC-2013	29-NOV-2013	✖	
<b>Soil Glass Jar - Unpreserved (EP074)</b> MA_MW07_3.0	25-NOV-2013	02-DEC-2013	02-DEC-2013	✔	02-DEC-2013	02-DEC-2013	✔	
<b>EP074F: Halogenated Aromatic Compounds</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB65_3.5, MA_MW01_2.6	22-NOV-2013	02-DEC-2013	29-NOV-2013	✖	02-DEC-2013	29-NOV-2013	✖	
<b>Soil Glass Jar - Unpreserved (EP074)</b> MA_MW07_3.0	25-NOV-2013	02-DEC-2013	02-DEC-2013	✔	02-DEC-2013	02-DEC-2013	✔	
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB65_3.5, MA_MW01_2.6	22-NOV-2013	02-DEC-2013	29-NOV-2013	✖	02-DEC-2013	29-NOV-2013	✖	
<b>Soil Glass Jar - Unpreserved (EP074)</b> MA_MW07_3.0	25-NOV-2013	02-DEC-2013	02-DEC-2013	✔	02-DEC-2013	02-DEC-2013	✔	
<b>EP074H: Naphthalene</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB65_3.5, MA_MW01_2.6	22-NOV-2013	02-DEC-2013	29-NOV-2013	✖	02-DEC-2013	29-NOV-2013	✖	
<b>Soil Glass Jar - Unpreserved (EP074)</b> MA_MW07_3.0	25-NOV-2013	02-DEC-2013	02-DEC-2013	✔	02-DEC-2013	02-DEC-2013	✔	
<b>EP074B: Oxygenated Compounds</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB65_3.5, MA_MW01_2.6	22-NOV-2013	02-DEC-2013	29-NOV-2013	✖	02-DEC-2013	29-NOV-2013	✖	
<b>Soil Glass Jar - Unpreserved (EP074)</b> MA_MW07_3.0	25-NOV-2013	02-DEC-2013	02-DEC-2013	✔	02-DEC-2013	02-DEC-2013	✔	
<b>EP074C: Sulfonated Compounds</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MK_SB65_3.5, MA_MW01_2.6	22-NOV-2013	02-DEC-2013	29-NOV-2013	✖	02-DEC-2013	29-NOV-2013	✖	
<b>Soil Glass Jar - Unpreserved (EP074)</b> MA_MW07_3.0	25-NOV-2013	02-DEC-2013	02-DEC-2013	✔	02-DEC-2013	02-DEC-2013	✔	



Matrix: SOIL

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP074G: Trihalomethanes</b>								
Soil Glass Jar - Unpreserved (EP074) MK_SB65_3.5, MA_MW01_2.6	22-NOV-2013	02-DEC-2013	29-NOV-2013	✖	02-DEC-2013	29-NOV-2013	✖	
Soil Glass Jar - Unpreserved (EP074) MA_MW07_3.0	25-NOV-2013	02-DEC-2013	02-DEC-2013	✔	02-DEC-2013	02-DEC-2013	✔	
<b>EP075(SIM)A: Phenolic Compounds</b>								
Soil Glass Jar - Unpreserved (EP075(SIM)) MK_SB42_3.5, ME_MW04_2.5, MI_SB03_2.8, MI_SB06_1.4	21-NOV-2013	02-DEC-2013	05-DEC-2013	✔	03-DEC-2013	11-JAN-2014	✔	
Soil Glass Jar - Unpreserved (EP075(SIM)) MK_SB65_3.5, MA_MW01_2.6	22-NOV-2013	02-DEC-2013	06-DEC-2013	✔	03-DEC-2013	11-JAN-2014	✔	
Soil Glass Jar - Unpreserved (EP075(SIM)) MA_MW07_3.0	25-NOV-2013	02-DEC-2013	09-DEC-2013	✔	03-DEC-2013	11-JAN-2014	✔	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Soil Glass Jar - Unpreserved (EP075(SIM)) MK_SB42_3.5, ME_MW04_2.5, MI_SB03_2.8, MI_SB06_1.4	21-NOV-2013	02-DEC-2013	05-DEC-2013	✔	03-DEC-2013	11-JAN-2014	✔	
Soil Glass Jar - Unpreserved (EP075(SIM)) MK_SB65_3.5, MA_MW01_2.6	22-NOV-2013	02-DEC-2013	06-DEC-2013	✔	03-DEC-2013	11-JAN-2014	✔	
Soil Glass Jar - Unpreserved (EP075(SIM)) MA_MW07_3.0	25-NOV-2013	02-DEC-2013	09-DEC-2013	✔	03-DEC-2013	11-JAN-2014	✔	
<b>EP080: BTEXN</b>								
Soil Glass Jar - Unpreserved (EP080) TRIP BLANK, TRIP SPIKE, TSC	20-NOV-2013	02-DEC-2013	04-DEC-2013	✔	02-DEC-2013	04-DEC-2013	✔	
Soil Glass Jar - Unpreserved (EP080) MK_SB42_3.5, ME_MW04_2.5, MI_SB03_2.8, MI_SB06_1.4	21-NOV-2013	02-DEC-2013	05-DEC-2013	✔	02-DEC-2013	05-DEC-2013	✔	
Soil Glass Jar - Unpreserved (EP080) MK_SB65_3.5, MA_MW01_2.6	22-NOV-2013	02-DEC-2013	06-DEC-2013	✔	02-DEC-2013	06-DEC-2013	✔	
Soil Glass Jar - Unpreserved (EP080) MA_MW07_3.0	25-NOV-2013	02-DEC-2013	09-DEC-2013	✔	02-DEC-2013	09-DEC-2013	✔	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
Soil Glass Jar - Unpreserved (EP080) TRIP BLANK, TRIP SPIKE, TSC	20-NOV-2013	02-DEC-2013	04-DEC-2013	✔	02-DEC-2013	04-DEC-2013	✔	
Soil Glass Jar - Unpreserved (EP080) MK_SB42_3.5, ME_MW04_2.5, MI_SB03_2.8, MI_SB06_1.4	21-NOV-2013	02-DEC-2013	05-DEC-2013	✔	02-DEC-2013	05-DEC-2013	✔	
Soil Glass Jar - Unpreserved (EP080) MK_SB65_3.5, MA_MW01_2.6	22-NOV-2013	02-DEC-2013	06-DEC-2013	✔	02-DEC-2013	06-DEC-2013	✔	
Soil Glass Jar - Unpreserved (EP080) MA_MW07_3.0	25-NOV-2013	02-DEC-2013	09-DEC-2013	✔	02-DEC-2013	09-DEC-2013	✔	



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Moisture Content	EA055-103	4	40	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	2	15	13.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	4	35	11.4	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	4	34	11.8	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	10	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	15	6.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	35	5.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	34	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	10	10.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	15	6.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	35	5.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	34	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	10	10.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	15	6.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	35	5.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	34	5.9	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	10	10.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
TPH - Semivolatle Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (2013) Schedule B(3) (Method 506.1)
Volatile Organic Compounds	EP074	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option A - Concentrating)	ORG17A	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.







## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.
- For all matrices, no Matrix Spike outliers occur.

#### Regular Sample Surrogates

Sub-Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Samples Submitted</b>							
EP080S: TPH(V)/BTEX Surrogates	ES1325783-001	MK_SB42_3.5	1.2-Dichloroethane-D4	17060-07-0	71.5 %	72.8-133.2 %	Recovery less than lower data quality objective

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

Matrix: **SOIL**

Method Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>						
Soil Glass Jar - Unpreserved MK_SB65_3.5, MA_MW01_2.6	02-DEC-2013	29-NOV-2013	3	02-DEC-2013	29-NOV-2013	3
<b>EP074B: Oxygenated Compounds</b>						
Soil Glass Jar - Unpreserved MK_SB65_3.5, MA_MW01_2.6	02-DEC-2013	29-NOV-2013	3	02-DEC-2013	29-NOV-2013	3
<b>EP074C: Sulfonated Compounds</b>						
Soil Glass Jar - Unpreserved MK_SB65_3.5, MA_MW01_2.6	02-DEC-2013	29-NOV-2013	3	02-DEC-2013	29-NOV-2013	3
<b>EP074D: Fumigants</b>						
Soil Glass Jar - Unpreserved MK_SB65_3.5, MA_MW01_2.6	02-DEC-2013	29-NOV-2013	3	02-DEC-2013	29-NOV-2013	3
<b>EP074E: Halogenated Aliphatic Compounds</b>						
Soil Glass Jar - Unpreserved MK_SB65_3.5, MA_MW01_2.6	02-DEC-2013	29-NOV-2013	3	02-DEC-2013	29-NOV-2013	3
<b>EP074F: Halogenated Aromatic Compounds</b>						



Matrix: **SOIL**

Method Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
<b>EP074F: Halogenated Aromatic Compounds - Analysis Holding Time Compliance</b>						
<b>Soil Glass Jar - Unpreserved</b> MK_SB65_3.5, MA_MW01_2.6	02-DEC-2013	29-NOV-2013	3	02-DEC-2013	29-NOV-2013	3
<b>EP074G: Trihalomethanes</b>						
<b>Soil Glass Jar - Unpreserved</b> MK_SB65_3.5, MA_MW01_2.6	02-DEC-2013	29-NOV-2013	3	02-DEC-2013	29-NOV-2013	3
<b>EP074H: Naphthalene</b>						
<b>Soil Glass Jar - Unpreserved</b> MK_SB65_3.5, MA_MW01_2.6	02-DEC-2013	29-NOV-2013	3	02-DEC-2013	29-NOV-2013	3

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- **No Quality Control Sample Frequency Outliers exist.**

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

**Work Order : ES1325783**

<p><b>Client : ENVIRO RESOURCES MANAGEMENT</b></p> <p><b>Contact : MR JONATHAN LEKAWSKI</b></p> <p><b>Address : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007</b></p>	<p><b>Laboratory : Environmental Division Sydney</b></p> <p><b>Contact : Barbara Hanna</b></p> <p><b>Address : 277-289 Woodpark Road Smithfield NSW Australia 2164</b></p>
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<p><b>E-mail : jonathan.lekawski@erm.com</b></p> <p><b>Telephone : +61 02 8584 8888</b></p> <p><b>Facsimile : +61 02 8584 8800</b></p>	<p><b>E-mail : Barbara.Hanna@alsglobal.com</b></p> <p><b>Telephone : +61 2 8784 8555</b></p> <p><b>Facsimile : +61 2 8784 8555</b></p>
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<p><b>Project : PROJECT SYMPHONY - MP</b></p> <p><b>Order number : 0207423</b></p> <p><b>C-O-C number : ----</b></p> <p><b>Site : ----</b></p> <p><b>Sampler : TS, GP</b></p>	<p><b>Page : 1 of 3</b></p> <p><b>Quote number : ES2013ENVRES0370 (SY/278/13 V3)</b></p> <p><b>QC Level : NEPM 2013 Schedule B(3) and ALS QCS3 requirement</b></p>
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#### Dates

<p><b>Date Samples Received : 27-NOV-2013</b></p> <p><b>Client Requested Due Date : 04-DEC-2013</b></p>	<p><b>Issue Date : 28-NOV-2013 11:57</b></p> <p><b>Scheduled Reporting Date : 04-DEC-2013</b></p>
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#### Delivery Details

<p><b>Mode of Delivery : Carrier</b></p> <p><b>No. of coolers/boxes : 5 HARD</b></p> <p><b>Security Seal : Intact.</b></p>	<p><b>Temperature : 13.6°C - Ice bricks present</b></p> <p><b>No. of samples received : 19</b></p> <p><b>No. of samples analysed : 10</b></p>
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#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Samples #20 and #21 were received extra, placed on hold.**
- **Sample " MI\_SB04\_1.6 " ( ALS #3 ) was not received.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL	No analysis requested	SOIL - EG005T (solids)	Total Metals by ICP-AES	SOIL - EP066 (solids)	Polychlorinated Biphenyls by GCMS	SOIL - EP074 (solids)	Volatile Organic Compounds	SOIL - S-18 (NO MOIST)	TRH(C6-C9)/BTEXN with No Moisture for TBs	SOIL - S-27	TRH/BTEXN/PAH/Phenols/8Metals
ES1325783-001	21-NOV-2013 15:00	MK_SB42_3.5		✓									✓	
ES1325783-002	21-NOV-2013 15:00	ME_MW04_2.5		✓									✓	
ES1325783-004	21-NOV-2013 15:00	MI_SB03_2.8		✓									✓	
ES1325783-005	21-NOV-2013 15:00	MI_SB06_1.4		✓									✓	
ES1325783-006	22-NOV-2013 15:00	MK_SB65_3.5		✓	✓	✓	✓						✓	
ES1325783-007	22-NOV-2013 15:00	MA_MW01_2.6		✓	✓	✓	✓						✓	
ES1325783-008	25-NOV-2013 15:00	MA_MW07_3.0		✓	✓	✓	✓						✓	
ES1325783-009	20-NOV-2013 15:00	TRIP BLANK										✓		
ES1325783-010	20-NOV-2013 15:00	TRIP SPIKE										✓		
ES1325783-011	20-NOV-2013 15:00	TSC										✓		
ES1325783-012	21-NOV-2013 15:00	MK_SB42_2.5	✓											
ES1325783-013	21-NOV-2013 15:00	MK_SB42_4.5	✓											
ES1325783-014	21-NOV-2013 15:00	ME_MW04_8.0	✓											
ES1325783-015	21-NOV-2013 15:00	MB_MW02_8.9	✓											
ES1325783-016	21-NOV-2013 15:00	MB_MW02_11.6	✓											
ES1325783-018	22-NOV-2013 15:00	MA_MW01_1.7	✓											
ES1325783-019	21-NOV-2013 15:00	MA_MW07_2.6	✓											
ES1325783-020	21-NOV-2013 15:00	MI_SB04_2.1	✓											
ES1325783-021	25-NOV-2013 15:00	MA_MW07_8.1	✓											

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com





# CHAIN OF CUSTODY

ALS Laboratory  
please tick →

1. This form must be filled out for every sample.  
2. It must be filled out by the person who collects the sample.  
3. It must be filled out by the person who transports the sample.  
4. It must be filled out by the person who receives the sample at the laboratory.  
5. It must be filled out by the person who analyzes the sample.  
6. It must be filled out by the person who reports the results.

7. The form must be filled out in the following order:  
8. The form must be filled out in the following order:  
9. The form must be filled out in the following order:  
10. The form must be filled out in the following order:

11. The form must be filled out in the following order:  
12. The form must be filled out in the following order:  
13. The form must be filled out in the following order:  
14. The form must be filled out in the following order:

15. The form must be filled out in the following order:  
16. The form must be filled out in the following order:  
17. The form must be filled out in the following order:  
18. The form must be filled out in the following order:

CLIENT: ERM

OFFICE: Sydney

PROJECT: Project Symphony - NP

ORDER NUMBER: 0207423

PROJECT MANAGER: Jonathan Lekawski

SAMPLER: (Name) Gavin Powell

COC emailed to ALS? (YES/NO)

Email Reports to (will default to PM if no other addresses are listed):

Email Invoice to (will default to PM if no other addresses are listed):

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

### TURNAROUND REQUIREMENTS:

(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)

ALS QUOTE NO.: SY/27813

Standard TAT (List due date):  Non Standard or urgent TAT (List due date):

RELINQUISHED BY: *Traverse Shaw*

RECEIVED BY: *Dav...*

DATE/TIME: *26.11.13 16:30*

DATE/TIME: *27/11 0830*

### FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes/No

Free Ice / frozen Ice block present upon receipt? Yes/No

Random Sample Temperature on Receipt: °C

Other comment:

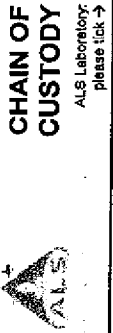
RELINQUISHED BY: DATE/TIME:

RECEIVED BY: DATE/TIME:

ALS USE	SAMPLE DETAILS MATRIX: SOLID(S) WATER (W)	CONTAINER INFORMATION	ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).							Additional Information				
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below)	(refer to TOTAL CONTAINERS)	S-27 (8 metals- As, Cd, Cr, Cu, Ni, Pb, Zn, Hg, TRH/BTEX, PAH/Phenols)	Additional Metal - Se	TRH / BTEX / PAH / Phenol	Asbestos	VOC Scan	PCB	Particle Sizing (hydrometer), TOC -	pH, Exchangeable Cations plus ECEC	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.

	MA-MW01-17	22.11.13	Soil	Yes	1	X	X	X	X	X	X	X		HLSD
	MA-MW01-2.6	↓	↓	↓	1	X	X	X	X	X	X	X		HLSD
	MA-MW07-2.6	25.11.13	"	Yes	1	X	X	X	X	X	X	X		HLSD
	MA-MW07-3.0	"	"	"	1	X	X	X	X	X	X	X		HLSD
	TRIP BLANK	"	"	"	1									
	RELIP SPILLZ	20.11.13	↓	"	1									
	TSO	"	"	"	1									

Water Containder Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORG = Nitric Preserved ORG; SH = Sodium Hydroxide Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Via HCl Preserved; VB = VOA Via Sodium Bisulfate Preserved; VB = VOA Via Sulfuric Preserved; AV = Airfreight Unpreserved Via SQ = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ABS = Plastic Bag for Acid Soluble Soils; B = Unpreserved Bag.



**CHAIN OF CUSTODY**  
ALS Laboratory  
please tick →

These fields are for use by the laboratory only. Do not fill in these fields unless you are an ALS Laboratory staff member.  
If you are a client, please do not fill in these fields.  
If you are a laboratory staff member, please do not fill in these fields unless you are a member of the laboratory staff.

Environmental Division  
Sydney  
Work Order  
**ES1325783**



Telephone : + 61-2-8784 8555

**CLIENT:** ERM  
**OFFICE:** Sydney  
**PROJECT:** Project Symphony - MP  
**ORDER NUMBER:** 0207423  
**PROJECT MANAGER:** Jonathan Lekawski  
**SAMPLER:** Thayne Shaw/ Gavin Powell  
**COC emailed to ALS? ( YES NO )**  
**Email Reports to (will default to PM if no other addresses are listed):** Symphony.DeltaWest@arm.com  
**Email Invoice to (will default to PM if no other addresses are listed):** Symphony.DeltaWest@arm.com

**TURNAROUND REQUIREMENTS:**  Standard TAT (List due date): SY278/13  
 Non Standard or urgent TAT (List due date):

**FOR LABORATORY:**  
Custody Seal Initiated?   
Free Ice / frozen for receipt?   
Random Sample Yes   
Other comment:

**RECEIVED BY:** David  
**DATE/TIME:** 27/11 0830

**RELINQUISHED BY:** Thayne Shaw  
**DATE/TIME:** 28/11/13 0630

**CONTACT PH:**  
**SAMPLER MOBILE:** 0435 960 035  
**EDD FORMAT (or default):** pdf/csv/excel

**COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:**

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below)	TOTAL CONTAINERS (refer to	ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to extract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).	Additional Information
1	MK-SB42-2.5	21-11-13	Soil	Yellow	1	Asbestos VOC Scan PCB Particle Sizing, TOC pH, Exchangeable Cations plus ECEC	
1	MK-SB42-3.5			"	1		Hold
2	MK-SB42-4.5			"	1		Hold
1	ME-MW04-2.5			"	1		Hold
1	ME-MW04-8.0			"	1		Hold
1	MB-MW02-8.9			"	1		Hold
1	MB-MW02-11.6			"	1		Hold
3	ME-SB04-1.6	not received		"	1		
4	ME-SB03-2.8			"	1		
5	ME-SB06-1.4			"	1		
6	MK-SB05-3.5	22-11-13		"	1		
7	VQA-SB05-3.5			"	1		
8	VQA-SB05-3.5			"	1		
9	VQA-SB05-3.5			"	1		
10	VQA-SB05-3.5			"	1		
11	VQA-SB05-3.5			"	1		
12	VQA-SB05-3.5			"	1		
13	VQA-SB05-3.5			"	1		
14	VQA-SB05-3.5			"	1		
15	VQA-SB05-3.5			"	1		
16	VQA-SB05-3.5			"	1		
17	VQA-SB05-3.5			"	1		
18	VQA-SB05-3.5			"	1		
19	VQA-SB05-3.5			"	1		
20	VQA-SB05-3.5			"	1		
21	VQA-SB05-3.5			"	1		
22	VQA-SB05-3.5			"	1		
23	VQA-SB05-3.5			"	1		
24	VQA-SB05-3.5			"	1		
25	VQA-SB05-3.5			"	1		
26	VQA-SB05-3.5			"	1		
27	VQA-SB05-3.5			"	1		
28	VQA-SB05-3.5			"	1		
29	VQA-SB05-3.5			"	1		
30	VQA-SB05-3.5			"	1		
31	VQA-SB05-3.5			"	1		
32	VQA-SB05-3.5			"	1		
33	VQA-SB05-3.5			"	1		
34	VQA-SB05-3.5			"	1		
35	VQA-SB05-3.5			"	1		
36	VQA-SB05-3.5			"	1		
37	VQA-SB05-3.5			"	1		
38	VQA-SB05-3.5			"	1		
39	VQA-SB05-3.5			"	1		
40	VQA-SB05-3.5			"	1		
41	VQA-SB05-3.5			"	1		
42	VQA-SB05-3.5			"	1		
43	VQA-SB05-3.5			"	1		
44	VQA-SB05-3.5			"	1		
45	VQA-SB05-3.5			"	1		
46	VQA-SB05-3.5			"	1		
47	VQA-SB05-3.5			"	1		
48	VQA-SB05-3.5			"	1		
49	VQA-SB05-3.5			"	1		
50	VQA-SB05-3.5			"	1		

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORG = Nitric Preserved Plastic; ORG = Nitric Preserved Plastic; S = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide/Cd Preserved; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic  
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speculation Bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;  
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ABS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag





## CERTIFICATE OF ANALYSIS

Work Order	: <b>ES1325900</b>	Page	: 1 of 12
Client	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: PROJECT SYMPHONY - MP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 0207423		
C-O-C number	: ----	Date Samples Received	: 28-NOV-2013
Sampler	: TS	Issue Date	: 09-DEC-2013
Site	: ----		
Quote number	: SY/278/13 V3	No. of samples received	: 13
		No. of samples analysed	: 10

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EA200 Legend**
- **EA200 'Am' Amosite (brown asbestos)**
- **EA200 'Ch' Chrysotile (white asbestos)**
- **EA200 'Cr' Crocidolite (blue asbestos)**
- **EA200 'Trace' - Asbestos fibres detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres**
- **EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.**
- **EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.**
- **EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.**
- **EP080: The TRIP SPIKE and TRIP SPIKE CONTROL have been analysed for volatile TPH and BTEX only. The TRIP SPIKE and TRIP SPIKE CONTROL were prepared in the lab using reagent grade sand spiked with petrol. The TRIP SPIKE was dispatched from the lab and the TRIP SPIKE CONTROL retained. The spike samples were extracted and analysed concurrently with samples reported in this batch.**



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

## Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ashesh Patel	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Hamish Murray	Supervisor - Soils	Newcastle - Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Shaun Spooner	Laboratory Technician	Newcastle - Asbestos
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MA_MW12_2.8	MA_MW12_4.9-5.0	MB_MW02_15.7	ML_SB40_0.1	ML_SB32_0.05
				26-NOV-2013 15:00	26-NOV-2013 15:00	26-NOV-2013 15:00	26-NOV-2013 15:00	26-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325900-003	ES1325900-005	ES1325900-006	ES1325900-007	ES1325900-008
<b>EA150: Particle Sizing</b>								
+75µm	----	1	%	----	64	----	----	----
+150µm	----	1	%	----	57	----	----	----
+300µm	----	1	%	----	44	----	----	----
+425µm	----	1	%	----	36	----	----	----
+600µm	----	1	%	----	29	----	----	----
+1180µm	----	1	%	----	21	----	----	----
+2.36mm	----	1	%	----	16	----	----	----
+4.75mm	----	1	%	----	10	----	----	----
+9.5mm	----	1	%	----	4	----	----	----
+19.0mm	----	1	%	----	<1	----	----	----
+37.5mm	----	1	%	----	<1	----	----	----
+75.0mm	----	1	%	----	<1	----	----	----
<b>EA002 : pH (Soils)</b>								
pH Value	----	0.1	pH Unit	----	5.3	----	----	----
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	10.9	----	17.9	13.5	16.3
<b>EA150: Soil Classification based on Particle Size</b>								
Fines (<75 µm)	----	1	%	----	36	----	----	----
Sand (>75 µm)	----	1	%	----	49	----	----	----
Gravel (>2mm)	----	1	%	----	16	----	----	----
Cobbles (>6cm)	----	1	%	----	<1	----	----	----
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	----	----	----	No	No
Asbestos Type	1332-21-4	0.1	--	----	----	----	-	-
Sample weight (dry)	----	0.01	g	----	----	----	84.0	124
APPROVED IDENTIFIER:	----	-	--	----	----	----	S.SPOONER	S.SPOONER
<b>ED008: Exchangeable Cations</b>								
Exchangeable Calcium	----	0.1	meq/100g	----	2.2	----	----	----
Exchangeable Magnesium	----	0.1	meq/100g	----	2.2	----	----	----
Exchangeable Potassium	----	0.1	meq/100g	----	0.2	----	----	----
Exchangeable Sodium	----	0.1	meq/100g	----	<0.1	----	----	----
Exchangeable Aluminium	----	0.1	meq/100g	----	<0.1	----	----	----
Cation Exchange Capacity	----	0.1	meq/100g	----	4.6	----	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MA_MW12_2.8	MA_MW12_4.9-5.0	MB_MW02_15.7	ML_SB40_0.1	ML_SB32_0.05
				26-NOV-2013 15:00	26-NOV-2013 15:00	26-NOV-2013 15:00	26-NOV-2013 15:00	26-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325900-003	ES1325900-005	ES1325900-006	ES1325900-007	ES1325900-008
<b>ED008: Exchangeable Cations - Continued</b>								
Exchangeable Sodium Percent	----	0.1	%	----	1.7	----	----	----
Calcium/Magnesium Ratio	----	0.1	-	----	1.0	----	----	----
Magnesium/Potassium Ratio	----	0.1	-	----	12.1	----	----	----
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	----	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	12	----	<5	<5	8
Cadmium	7440-43-9	1	mg/kg	<1	----	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	6	----	16	4	5
Copper	7440-50-8	5	mg/kg	16	----	6	8	13
Lead	7439-92-1	5	mg/kg	20	----	10	8	16
Nickel	7440-02-0	2	mg/kg	26	----	10	14	13
Zinc	7440-66-6	5	mg/kg	55	----	36	26	47
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	<0.1	<0.1	<0.1
<b>EP004: Organic Matter</b>								
Organic Matter	----	0.5	%	----	1.2	----	----	----
Total Organic Carbon	----	0.5	%	----	0.7	----	----	----
<b>EP066: Polychlorinated Biphenyls (PCB)</b>								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	----	----	----	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	<0.5	----	----	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	----	----	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	----	----	----	----
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	----	----	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	----	----	----	----
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	----	----	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	----	----	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	----	----	----	----
n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	----	----	----	----
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	<5	----	----	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	----	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	----	----	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MA_MW12_2.8	MA_MW12_4.9-5.0	MB_MW02_15.7	ML_SB40_0.1	ML_SB32_0.05
				26-NOV-2013 15:00	26-NOV-2013 15:00	26-NOV-2013 15:00	26-NOV-2013 15:00	26-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325900-003	ES1325900-005	ES1325900-006	ES1325900-007	ES1325900-008
<b>EP074B: Oxygenated Compounds - Continued</b>								
2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	----	----	----	----
<b>EP074C: Sulfonated Compounds</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	----	----	----	----
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	----	----	----	----
1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	----	----	----	----
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	----	----	----	----
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	----	----	----	----
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	----	----	----	----
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	----	----	----	----
Chloromethane	74-87-3	5	mg/kg	<5	----	----	----	----
Vinyl chloride	75-01-4	5	mg/kg	<5	----	----	----	----
Bromomethane	74-83-9	5	mg/kg	<5	----	----	----	----
Chloroethane	75-00-3	5	mg/kg	<5	----	----	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg	<5	----	----	----	----
1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	----	----	----	----
Iodomethane	74-88-4	0.5	mg/kg	<0.5	----	----	----	----
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	----	----	----	----
1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	----	----	----	----
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	----	----	----	----
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	----	----	----	----
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	----	----	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	----	----	----	----
1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	----	----	----	----
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	----	----	----	----
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	----	----	----	----
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	----	----	----	----
1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	----	----	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	----	----	----	----
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	----	----	----	----
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	----	----	----	----
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	----	----	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MA_MW12_2.8	MA_MW12_4.9-5.0	MB_MW02_15.7	ML_SB40_0.1	ML_SB32_0.05
				26-NOV-2013 15:00	26-NOV-2013 15:00	26-NOV-2013 15:00	26-NOV-2013 15:00	26-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325900-003	ES1325900-005	ES1325900-006	ES1325900-007	ES1325900-008
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	----	----	----	----
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	----	----	----	----
Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	----	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	----	----	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	----	----	----	----
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	----	----	----	----
Bromobenzene	108-86-1	0.5	mg/kg	<0.5	----	----	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	----	----	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	----	----	----	----
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	----	----	----	----
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	----	----	----	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	----	----	----	----
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	----	----	----	----
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	<0.5	----	----	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	----	----	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	----	----	----	----
Bromoform	75-25-2	0.5	mg/kg	<0.5	----	----	----	----
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	5	mg/kg	<5	----	----	----	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	----	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MA_MW12_2.8	MA_MW12_4.9-5.0	MB_MW02_15.7	ML_SB40_0.1	ML_SB32_0.05
				26-NOV-2013 15:00	26-NOV-2013 15:00	26-NOV-2013 15:00	26-NOV-2013 15:00	26-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325900-003	ES1325900-005	ES1325900-006	ES1325900-007	ES1325900-008
<b>EP075(SIM)A: Phenolic Compounds - Continued</b>								
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	----	<2	<2	<2
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	<0.5	1.6	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	<0.5	0.8	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	<0.5	0.6	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	----	<0.5	3.0	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	----	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	----	1.2	1.2	1.2
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	----	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	----	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	----	<100	300	<100
C29 - C36 Fraction	----	100	mg/kg	<100	----	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	<50	300	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	----	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	----	<50	60	<50





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MA_MW12_2.8	MA_MW12_4.9-5.0	MB_MW02_15.7	ML_SB40_0.1	ML_SB32_0.05
				26-NOV-2013 15:00	26-NOV-2013 15:00	26-NOV-2013 15:00	26-NOV-2013 15:00	26-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325900-003	ES1325900-005	ES1325900-006	ES1325900-007	ES1325900-008
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 - Continued</b>								
>C16 - C34 Fraction	----	100	mg/kg	<100	----	<100	330	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	----	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	<50	390	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	----	<50	60	<50
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	----	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	----	<1	<1	<1
<b>EP066S: PCB Surrogate</b>								
Decachlorobiphenyl	2051-24-3	0.1	%	74.2	----	----	----	----
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	123	----	----	----	----
Toluene-D8	2037-26-5	0.1	%	119	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	120	----	----	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	90.2	----	84.2	89.0	89.1
2-Chlorophenol-D4	93951-73-6	0.1	%	99.1	----	92.4	98.5	101
2,4,6-Tribromophenol	118-79-6	0.1	%	106	----	98.6	111	108
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	101	----	95.4	102	101
Anthracene-d10	1719-06-8	0.1	%	92.0	----	84.6	84.0	89.6
4-Terphenyl-d14	1718-51-0	0.1	%	90.6	----	84.9	89.0	89.3
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	110	----	80.2	93.4	91.9
Toluene-D8	2037-26-5	0.1	%	109	----	90.5	101	101
4-Bromofluorobenzene	460-00-4	0.1	%	109	----	82.7	90.5	96.2



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_SB30_0.1	ML_SB39_0.1	TRIP BLANK	TRIP SPIKE	TSC
				26-NOV-2013 15:00	26-NOV-2013 15:00	26-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325900-009	ES1325900-010	ES1325900-011	ES1325900-012	ES1325900-013
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	33.2	13.0	----	----	----
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	----	----	----
Asbestos Type	1332-21-4	0.1	--	-	-	----	----	----
Sample weight (dry)	----	0.01	g	71.7	110	----	----	----
APPROVED IDENTIFIER:	----	-	--	S.SPOONER	S.SPOONER	----	----	----
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	----	----	----
Arsenic	7440-38-2	5	mg/kg	14	<5	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	25	4	----	----	----
Copper	7440-50-8	5	mg/kg	28	15	----	----	----
Lead	7439-92-1	5	mg/kg	40	27	----	----	----
Nickel	7440-02-0	2	mg/kg	14	10	----	----	----
Zinc	7440-66-6	5	mg/kg	10	276	----	----	----
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	0.1	<0.1	----	----	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	----	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	----	----	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	----	----	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	----	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	----	----	----
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	----	----	----
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	----	----	----
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	----	----	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	----	----	----
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	----	----	----
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	----	----	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	----	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	----	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_SB30_0.1	ML_SB39_0.1	TRIP BLANK	TRIP SPIKE	TSC
				26-NOV-2013 15:00	26-NOV-2013 15:00	26-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325900-009	ES1325900-010	ES1325900-011	ES1325900-012	ES1325900-013
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	1.3	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	1.3	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	0.8	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	0.6	----	----	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	----	----	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	4.0	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	----	----	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	73	87
C10 - C14 Fraction	----	50	mg/kg	<50	50	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	410	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	120	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	580	----	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	86	102
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	51	63
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	90	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	460	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	550	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	90	----	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_SB30_0.1	ML_SB39_0.1	TRIP BLANK	TRIP SPIKE	TSC
				26-NOV-2013 15:00	26-NOV-2013 15:00	26-NOV-2013 15:00	20-NOV-2013 15:00	20-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325900-009	ES1325900-010	ES1325900-011	ES1325900-012	ES1325900-013
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	0.4	0.5
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	17.3	19.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	2.1	2.3
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	11.0	12.1
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	4.4	4.8
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	35.2	39.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	15.4	16.9
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	85.1	76.9	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	94.4	95.4	----	----	----
2,4,6-Tribromophenol	118-79-6	0.1	%	101	95.4	----	----	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	97.2	101	----	----	----
Anthracene-d10	1719-06-8	0.1	%	85.9	77.4	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	86.3	86.2	----	----	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	81.9	92.1	89.3	86.1	86.9
Toluene-D8	2037-26-5	0.1	%	85.6	101	92.3	88.0	93.2
4-Bromofluorobenzene	460-00-4	0.1	%	81.6	92.0	86.0	93.1	96.7

## Analytical Results

### Descriptive Results

Sub-Matrix: SOIL

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>		
EA200: Description	ML_SB40_0.1 - 26-NOV-2013 15:00	Dark grey soil with dark grey rocks plus some vegetation.
EA200: Description	ML_SB32_0.05 - 26-NOV-2013 15:00	Mid grey - brown clay soil with grey and orange rocks plus a trace of vegetation.
EA200: Description	ML_SB30_0.1 - 26-NOV-2013 15:00	Mid brown clay soil with dark grey and orange rocks plus a trace of vegetation.
EA200: Description	ML_SB39_0.1 - 26-NOV-2013 15:00	Mid grey soil with dark grey and orange rocks plus a trace of vegetation.



## Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP066S: PCB Surrogate</b>			
Decachlorobiphenyl	2051-24-3	39	149
<b>EP074S: VOC Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	64	130
Toluene-D8	2037-26-5	66	136
4-Bromofluorobenzene	460-00-4	60	122
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

## QUALITY CONTROL REPORT

Work Order	: <b>ES1325900</b>	Page	: 1 of 16
Client	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
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Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: PROJECT SYMPHONY - MP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 28-NOV-2013
C-O-C number	: ----	Issue Date	: 09-DEC-2013
Sampler	: TS	No. of samples received	: 13
Order number	: 0207423	No. of samples analysed	: 10
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :  
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
RPD = Relative Percentage Difference  
# = Indicates failed QC



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Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

## Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ashesh Patel	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Hamish Murray	Supervisor - Soils	Newcastle - Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Shaun Spooner	Laboratory Technician	Newcastle - Asbestos
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics



### Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EA002 : pH (Soils) (QC Lot: 3185860)</b>									
ES1325574-011	Anonymous	EA002: pH Value	----	0.1	pH Unit	6.2	6.3	0.0	0% - 20%
ES1325738-001	Anonymous	EA002: pH Value	----	0.1	pH Unit	7.2	7.2	0.0	0% - 20%
<b>EA055: Moisture Content (QC Lot: 3190923)</b>									
ES1325847-004	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	20.1	19.0	5.8	0% - 20%
ES1325900-003	MA_MW12_2.8	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	10.9	12.4	12.5	0% - 50%
<b>ED008: Exchangeable Cations (QC Lot: 3190612)</b>									
ES1325900-005	MA_MW12_4.9-5.0	ED008: Calcium/Magnesium Ratio	----	0.1	-	1.0	1.0	0.0	0% - 20%
		ED008: Magnesium/Potassium Ratio	----	0.1	-	12.1	12.3	2.0	0% - 20%
		ED008: Exchangeable Sodium Percent	----	0.1	%	1.7	1.7	0.0	0% - 20%
		ED008: Exchangeable Calcium	----	0.1	meq/100g	2.2	2.1	0.0	0% - 20%
		ED008: Exchangeable Magnesium	----	0.1	meq/100g	2.2	2.1	4.9	0% - 20%
		ED008: Exchangeable Potassium	----	0.1	meq/100g	0.2	0.2	0.0	0% - 20%
		ED008: Exchangeable Sodium	----	0.1	meq/100g	<0.1	<0.1	0.0	0% - 20%
		ED008: Exchangeable Aluminium	----	0.1	meq/100g	<0.1	<0.1	0.0	0% - 20%
		ED008: Cation Exchange Capacity	----	0.1	meq/100g	4.6	4.5	4.1	0% - 20%
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3192314)</b>									
ES1325889-002	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	14	15	8.6	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	5	5	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	9	11	19.4	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	11	12	9.5	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	9	9	0.0	No Limit
ES1325901-007	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	5	4	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	27	24	10.2	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	272	231	16.1	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	81	60	29.7	0% - 50%
		EG005T: Copper	7440-50-8	5	mg/kg	1770	1660	6.6	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	27	26	6.8	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	140	128	9.2	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	1010	959	5.2	0% - 20%
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3192313)</b>									
ES1325741-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1325840-004	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit





Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3192315)</b>									
ES1325889-002	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1325901-007	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.3	0.3	0.0	No Limit
<b>EP004: Organic Matter (QC Lot: 3192491)</b>									
ES1325879-002	Anonymous	EP004: Organic Matter	----	0.5	%	0.6	0.6	0.0	No Limit
		EP004: Total Organic Carbon	----	0.5	%	<0.5	<0.5	0.0	No Limit
<b>EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 3190624)</b>									
ES1325880-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1325886-004	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3187743)</b>									
ES1325899-001	Anonymous	EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074B: Oxygenated Compounds (QC Lot: 3187743)</b>									
ES1325899-001	Anonymous	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.0	No Limit
<b>EP074C: Sulfonated Compounds (QC Lot: 3187743)</b>									
ES1325899-001	Anonymous	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074D: Fumigants (QC Lot: 3187743)</b>									
ES1325899-001	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3187743)</b>									
ES1325899-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3187743) - continued</b>									
ES1325899-001	Anonymous	EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.0	No Limit
EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.0	No Limit		
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.0	No Limit		
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3187743)</b>									
ES1325899-001	Anonymous	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074G: Trihalomethanes (QC Lot: 3187743)</b>									
ES1325899-001	Anonymous	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074H: Naphthalene (QC Lot: 3187743)</b>									
ES1325899-001	Anonymous	EP074: Naphthalene	91-20-3	5	mg/kg	<5	<5	0.0	No Limit
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3189101)</b>									
ES1325842-047	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3189101) - continued</b>									
ES1325842-047	Anonymous	EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
ES1325899-002	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit		
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3189101)</b>									
ES1325842-047	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3189101) - continued</b>									
ES1325842-047	Anonymous	EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1325899-002	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3187742)</b>									
ES1325899-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1325900-010	ML_SB39_0.1	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3189100)</b>									
ES1325842-047	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1325899-002	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3187742)</b>									
ES1325899-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES1325900-010	ML_SB39_0.1	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3189100)</b>									
ES1325842-047	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
ES1325899-002	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit



Sub-Matrix: <b>SOIL</b>				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3189100) - continued</b>									
ES1325899-002	Anonymous	EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3187742)</b>									
ES1325899-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES1325900-010	ML_SB39_0.1	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit



## Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>ED008: Exchangeable Cations (QCLot: 3190612)</b>									
ED008: Exchangeable Calcium	----	0.1	meq/100g	<0.1	1 meq/100g	123	90	128	
ED008: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	1.67 meq/100g	90.1	86	120	
ED008: Exchangeable Potassium	----	0.1	meq/100g	<0.1	0.51 meq/100g	117	85	135	
ED008: Exchangeable Sodium	----	0.1	meq/100g	<0.1	0.87 meq/100g	118	86	128	
ED008: Exchangeable Aluminium	----	0.1	meq/100g	<0.1	----	----	----	----	
ED008: Exchangeable Sodium Percent	----	0.1	%	<0.1	----	----	----	----	
ED008: Cation Exchange Capacity	----	0.1	meq/100g	<0.1	----	----	----	----	
ED008: Calcium/Magnesium Ratio	----	0.1	-	<0.1	----	----	----	----	
ED008: Magnesium/Potassium Ratio	----	0.1	-	<0.1	----	----	----	----	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3192314)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	113	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	106	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	102	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	108	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	102	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	110	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	116	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	116	81	133	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3192313)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	72.9	66	112	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3192315)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	69.2	66	112	
<b>EP004: Organic Matter (QCLot: 3192491)</b>									
EP004: Organic Matter	----	0.5	%	<0.5	4.58 %	97.8	85	105	
EP004: Total Organic Carbon	----	0.5	%	<0.5	2.66 %	97.7	84	106	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3190624)</b>									
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	85.0	57.4	117	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3187743)</b>									
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	77.5	64	126	
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	94.2	66	128	
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	91.4	63	129	
EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	89.4	63	129	
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	89.0	64	130	
EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	91.4	63	129	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3187743) - continued</b>									
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	93.5	63	129	
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	84.4	62	130	
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	79.3	61	131	
<b>EP074B: Oxygenated Compounds (QCLot: 3187743)</b>									
EP074: Vinyl Acetate	108-05-4	1	mg/kg	----	10 mg/kg	30.1	29.6	156	
		5	mg/kg	<5	----	----	----	----	
EP074: 2-Butanone (MEK)	78-93-3	1	mg/kg	----	10 mg/kg	114	58	136	
		5	mg/kg	<5	----	----	----	----	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	1	mg/kg	----	10 mg/kg	105	54	138	
		5	mg/kg	<5	----	----	----	----	
EP074: 2-Hexanone (MBK)	591-78-6	1	mg/kg	----	10 mg/kg	87.4	54	136	
		5	mg/kg	<5	----	----	----	----	
<b>EP074C: Sulfonated Compounds (QCLot: 3187743)</b>									
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	64.2	54	126	
<b>EP074D: Fumigants (QCLot: 3187743)</b>									
EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	74.7	55	133	
EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	87.4	69	127	
EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	82.4	54	124	
EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	79.0	51	125	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	90.4	66	126	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3187743)</b>									
EP074: Dichlorodifluoromethane	75-71-8	1	mg/kg	----	10 mg/kg	33.1	30	148	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloromethane	74-87-3	1	mg/kg	----	10 mg/kg	43.4	41	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Vinyl chloride	75-01-4	1	mg/kg	----	10 mg/kg	51.7	43	147	
		5	mg/kg	<5	----	----	----	----	
EP074: Bromomethane	74-83-9	1	mg/kg	----	10 mg/kg	51.9	47	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloroethane	75-00-3	1	mg/kg	----	10 mg/kg	62.2	49	143	
		5	mg/kg	<5	----	----	----	----	
EP074: Trichlorofluoromethane	75-69-4	1	mg/kg	----	10 mg/kg	66.7	49	135	
		5	mg/kg	<5	----	----	----	----	
EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	89.4	54	126	
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	62.0	43	129	
EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	79.5	62	130	
EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	86.0	66	132	
EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	85.7	66	132	
EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	86.4	62	126	





Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3187743) - continued</b>									
EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	84.0	64	128	
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	78.3	59	125	
EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	91.4	65	123	
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	87.4	64	120	
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	86.1	65	127	
EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	104	70	130	
EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	89.0	72	128	
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	89.3	67	143	
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	79.3	62	122	
EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	96.7	54	128	
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	96.9	55	129	
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	91.0	56	132	
EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	81.2	65	135	
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	75.4	19.8	134	
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	78.2	53	129	
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	74.6	48	136	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3187743)</b>									
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	84.7	70	128	
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	84.6	67	127	
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	91.4	64	130	
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	102	62	130	
EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	87.2	63	129	
EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	81.8	63	129	
EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	80.6	66	128	
EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	77.4	54	134	
EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	80.6	60	132	
<b>EP074G: Trihalomethanes (QCLot: 3187743)</b>									
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	87.4	62	120	
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	82.5	61	121	
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	78.2	63	121	
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	85.0	60	126	
<b>EP074H: Naphthalene (QCLot: 3187743)</b>									
EP074: Naphthalene	91-20-3	0.5	mg/kg	----	1 mg/kg	97.8	63	133	
		5	mg/kg	<5	----	----	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3189101)</b>									
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	82.4	74	116	
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	89.9	74	116	
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	107	72	116	





Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3189101) - continued</b>									
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	108	69	123	
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	88.2	60.3	117	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	88.0	69	117	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	94.8	68	112	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	98.6	73	117	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	92.1	76.4	114	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	93.0	57	111	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	93.4	68.9	112	
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	25.9	3.9	57	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3189101)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	93.5	80	124	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	106	77	123	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	100	79	123	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	108	77	123	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	108	79	123	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	102	79	123	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	107	79	123	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	108	79	125	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	99.1	73	121	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	102	81	123	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	96.3	70	118	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	107	77	123	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	98.4	76	122	
EP075(SIM): Indeno(1,2,3-cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	98.3	71	113	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	99.5	71.7	113	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	97.1	72.4	114	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3187742)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	93.7	68.4	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3189100)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	107	71	131	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	109	74	138	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	95.2	64	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3187742)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	94.5	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3189100)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	103	70	130	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	107	74	138	



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3189100) - continued</b>								
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
		50	mg/kg	----	150 mg/kg	76.7	63	131
<b>EP080: BTEXN (QCLot: 3187742)</b>								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	69.2	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	89.5	62	128
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	90.4	58	118
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	93.1	60	120
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	93.3	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	104	62	138

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%) Low High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3192314)</b>							
ES1325889-002	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	102	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	102	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	104	70	130
		EG005T: Copper	7440-50-8	125 mg/kg	107	70	130
		EG005T: Lead	7439-92-1	125 mg/kg	103	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	103	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	108	70	130
		EG005T: Zinc	7440-66-6	125 mg/kg	100	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3192313)</b>							
ES1325741-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	81.2	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3192315)</b>							
ES1325889-002	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	77.6	70	130
<b>EP004: Organic Matter (QCLot: 3192491)</b>							
ES1325879-002	Anonymous	EP004: Organic Matter	----	0.47 %	98.5	----	----
		EP004: Total Organic Carbon	----	0.27 %	85.2	----	----
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3190624)</b>							
ES1325880-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	82.0	70	130
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3187743)</b>							



Sub-Matrix: SOIL

				Matrix Spike (MS) Report				
				Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3187743) - continued</b>								
ES1325899-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	97.1	70	130	
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	100	70	130	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3187743)</b>								
ES1325899-001	Anonymous	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	89.1	70	130	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3189101)</b>								
ES1325842-047	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	75.8	70	130	
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	79.2	70	130	
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	74.1	60	130	
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	76.5	70	130	
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	54.4	20	130	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3189101)</b>								
ES1325842-047	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	77.2	70	130	
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	85.2	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3187742)</b>								
ES1325899-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	108	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3189100)</b>								
ES1325842-047	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	78.4	73	137	
		EP071: C15 - C28 Fraction	----	3140 mg/kg	80.6	53	131	
		EP071: C29 - C36 Fraction	----	2860 mg/kg	67.3	52	132	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3187742)</b>								
ES1325899-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	110	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3189100)</b>								
ES1325842-047	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	100	73	137	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	72.7	53	131	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	55.0	52	132	
<b>EP080: BTEXN (QCLot: 3187742)</b>								
ES1325899-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	71.4	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	92.0	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	92.6	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	93.0	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	95.6	70	130	
	EP080: Naphthalene	91-20-3	2.5 mg/kg	97.1	70	130		

**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report**



The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
					MS	MSD	Low	High	Value	Control Limit	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3187742)</b>											
ES1325899-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	108	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3187742)</b>											
ES1325899-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	110	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3187742)</b>											
ES1325899-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	71.4	----	70	130	----	----	
		EP080: Toluene	108-88-3	2.5 mg/kg	92.0	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	92.6	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	93.0	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	95.6	----	70	130	----	----	
		EP080: Naphthalene	91-20-3	2.5 mg/kg	97.1	----	70	130	----	----	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3187743)</b>											
ES1325899-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	97.1	----	70	130	----	----	
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	100	----	70	130	----	----	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3187743)</b>											
ES1325899-001	Anonymous	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	89.1	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3189100)</b>											
ES1325842-047	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	78.4	----	73	137	----	----	
		EP071: C15 - C28 Fraction	----	3140 mg/kg	80.6	----	53	131	----	----	
		EP071: C29 - C36 Fraction	----	2860 mg/kg	67.3	----	52	132	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3189100)</b>											
ES1325842-047	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	100	----	73	137	----	----	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	72.7	----	53	131	----	----	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	55.0	----	52	132	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3189101)</b>											
ES1325842-047	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	75.8	----	70	130	----	----	
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	79.2	----	70	130	----	----	
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	74.1	----	60	130	----	----	
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	76.5	----	70	130	----	----	
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	54.4	----	20	130	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3189101)</b>											
ES1325842-047	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	77.2	----	70	130	----	----	
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	85.2	----	70	130	----	----	
<b>EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3190624)</b>											
ES1325880-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	82.0	----	70	130	----	----	



Sub-Matrix: SOIL

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report							
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
					MS	MSD	Low	High	Value	Control Limit	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3192313)</b>											
ES1325741-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	81.2	----	70	130	----	----	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3192314)</b>											
ES1325889-002	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	102	----	70	130	----	----	
		EG005T: Cadmium	7440-43-9	50 mg/kg	102	----	70	130	----	----	
		EG005T: Chromium	7440-47-3	50 mg/kg	104	----	70	130	----	----	
		EG005T: Copper	7440-50-8	125 mg/kg	107	----	70	130	----	----	
		EG005T: Lead	7439-92-1	125 mg/kg	103	----	70	130	----	----	
		EG005T: Nickel	7440-02-0	50 mg/kg	103	----	70	130	----	----	
		EG005T: Selenium	7782-49-2	50 mg/kg	108	----	70	130	----	----	
		EG005T: Zinc	7440-66-6	125 mg/kg	100	----	70	130	----	----	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3192315)</b>											
ES1325889-002	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	77.6	----	70	130	----	----	
<b>EP004: Organic Matter (QCLot: 3192491)</b>											
ES1325879-002	Anonymous	EP004: Organic Matter	----	0.47 %	98.5	----	----	----	----	----	
		EP004: Total Organic Carbon	----	0.27 %	85.2	----	----	----	----	----	

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1325900</b>	Page	: 1 of 9
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: PROJECT SYMPHONY - MP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 28-NOV-2013
C-O-C number	: ----	Issue Date	: 09-DEC-2013
Sampler	: TS	No. of samples received	: 13
Order number	: 0207423	No. of samples analysed	: 10
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EA002 : pH (Soils)</b>							
<b>Soil Glass Jar - Unpreserved (EA002)</b> MA_MW12_4.9-5.0	26-NOV-2013	29-NOV-2013	03-DEC-2013	✓	29-NOV-2013	29-NOV-2013	✓
<b>EA055: Moisture Content</b>							
<b>Soil Glass Jar - Unpreserved (EA055-103)</b> MA_MW12_2.8, MB_MW02_15.7, ML_SB40_0.1, ML_SB32_0.05, ML_SB30_0.1, ML_SB39_0.1	26-NOV-2013	----	----	----	03-DEC-2013	10-DEC-2013	✓
<b>EA150: Particle Sizing</b>							
<b>Snap Lock Bag (EA150)</b> MA_MW12_4.9-5.0	26-NOV-2013	---	25-MAY-2014	----	09-DEC-2013	04-JUN-2014	✓
<b>EA150: Soil Classification based on Particle Size</b>							
<b>Snap Lock Bag (EA150)</b> MA_MW12_4.9-5.0	26-NOV-2013	---	25-MAY-2014	----	09-DEC-2013	04-JUN-2014	✓
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>							
<b>Snap Lock Bag (EA200)</b> ML_SB40_0.1, ML_SB32_0.05, ML_SB30_0.1, ML_SB39_0.1	26-NOV-2013	---	25-MAY-2014	----	09-DEC-2013	07-JUN-2014	✓
<b>ED008: Exchangeable Cations</b>							
<b>Soil Glass Jar - Unpreserved (ED008)</b> MA_MW12_4.9-5.0	26-NOV-2013	03-DEC-2013	24-DEC-2013	✓	05-DEC-2013	24-DEC-2013	✓
<b>EG005T: Total Metals by ICP-AES</b>							
<b>Soil Glass Jar - Unpreserved (EG005T)</b> MA_MW12_2.8, MB_MW02_15.7, ML_SB40_0.1, ML_SB32_0.05, ML_SB30_0.1, ML_SB39_0.1	26-NOV-2013	04-DEC-2013	25-MAY-2014	✓	04-DEC-2013	25-MAY-2014	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>							
<b>Soil Glass Jar - Unpreserved (EG035T)</b> MA_MW12_2.8, MB_MW02_15.7, ML_SB40_0.1, ML_SB32_0.05, ML_SB30_0.1, ML_SB39_0.1	26-NOV-2013	04-DEC-2013	24-DEC-2013	✓	05-DEC-2013	24-DEC-2013	✓



Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP004: Organic Matter</b>							
Soil Glass Jar - Unpreserved (EP004) MA_MW12_4.9-5.0	26-NOV-2013	04-DEC-2013	24-DEC-2013	✓	04-DEC-2013	24-DEC-2013	✓
<b>EP066: Polychlorinated Biphenyls (PCB)</b>							
Soil Glass Jar - Unpreserved (EP066) MA_MW12_2.8	26-NOV-2013	03-DEC-2013	10-DEC-2013	✓	03-DEC-2013	12-JAN-2014	✓
<b>EP080/071: Total Petroleum Hydrocarbons</b>							
Soil Glass Jar - Unpreserved (EP071) MA_MW12_2.8, ML_SB40_0.1, ML_SB30_0.1	26-NOV-2013	04-DEC-2013	10-DEC-2013	✓	04-DEC-2013	13-JAN-2014	✓
<b>EP074D: Fumigants</b>							
Soil Glass Jar - Unpreserved (EP074) MA_MW12_2.8	26-NOV-2013	03-DEC-2013	03-DEC-2013	✓	03-DEC-2013	03-DEC-2013	✓
<b>EP074E: Halogenated Aliphatic Compounds</b>							
Soil Glass Jar - Unpreserved (EP074) MA_MW12_2.8	26-NOV-2013	03-DEC-2013	03-DEC-2013	✓	03-DEC-2013	03-DEC-2013	✓
<b>EP074F: Halogenated Aromatic Compounds</b>							
Soil Glass Jar - Unpreserved (EP074) MA_MW12_2.8	26-NOV-2013	03-DEC-2013	03-DEC-2013	✓	03-DEC-2013	03-DEC-2013	✓
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>							
Soil Glass Jar - Unpreserved (EP074) MA_MW12_2.8	26-NOV-2013	03-DEC-2013	03-DEC-2013	✓	03-DEC-2013	03-DEC-2013	✓
<b>EP074H: Naphthalene</b>							
Soil Glass Jar - Unpreserved (EP074) MA_MW12_2.8	26-NOV-2013	03-DEC-2013	03-DEC-2013	✓	03-DEC-2013	03-DEC-2013	✓
<b>EP074B: Oxygenated Compounds</b>							
Soil Glass Jar - Unpreserved (EP074) MA_MW12_2.8	26-NOV-2013	03-DEC-2013	03-DEC-2013	✓	03-DEC-2013	03-DEC-2013	✓
<b>EP074C: Sulfonated Compounds</b>							
Soil Glass Jar - Unpreserved (EP074) MA_MW12_2.8	26-NOV-2013	03-DEC-2013	03-DEC-2013	✓	03-DEC-2013	03-DEC-2013	✓
<b>EP074G: Trihalomethanes</b>							
Soil Glass Jar - Unpreserved (EP074) MA_MW12_2.8	26-NOV-2013	03-DEC-2013	03-DEC-2013	✓	03-DEC-2013	03-DEC-2013	✓
<b>EP075(SIM)A: Phenolic Compounds</b>							
Soil Glass Jar - Unpreserved (EP075(SIM)) MA_MW12_2.8, ML_SB40_0.1, ML_SB30_0.1	26-NOV-2013	04-DEC-2013	10-DEC-2013	✓	04-DEC-2013	13-JAN-2014	✓





Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b>								
MA_MW12_2.8, ML_SB40_0.1, ML_SB30_0.1,	MB_MW02_15.7, ML_SB32_0.05, ML_SB39_0.1	26-NOV-2013	04-DEC-2013	10-DEC-2013	✓	04-DEC-2013	13-JAN-2014	✓
<b>EP080: BTEXN</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b>								
TRIP SPIKE,	TSC	20-NOV-2013	03-DEC-2013	04-DEC-2013	✓	03-DEC-2013	04-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b>								
MA_MW12_2.8, ML_SB40_0.1, ML_SB30_0.1, TRIP BLANK	MB_MW02_15.7, ML_SB32_0.05, ML_SB39_0.1,	26-NOV-2013	03-DEC-2013	10-DEC-2013	✓	03-DEC-2013	10-DEC-2013	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b>								
TRIP SPIKE,	TSC	20-NOV-2013	03-DEC-2013	04-DEC-2013	✓	03-DEC-2013	04-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b>								
MA_MW12_2.8, ML_SB40_0.1, ML_SB30_0.1, TRIP BLANK	MB_MW02_15.7, ML_SB32_0.05, ML_SB39_0.1,	26-NOV-2013	03-DEC-2013	10-DEC-2013	✓	03-DEC-2013	10-DEC-2013	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Exchangeable Cations with pre-treatment	ED008	1	7	14.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Moisture Content	EA055-103	2	16	12.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organic Matter	EP004	1	8	12.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
pH (1:5)	EA002	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	2	15	13.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	4	36	11.1	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	7	14.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
Exchangeable Cations with pre-treatment	ED008	1	7	14.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organic Matter	EP004	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	15	6.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	36	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	7	14.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
Exchangeable Cations with pre-treatment	ED008	1	7	14.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organic Matter	EP004	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	15	6.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	36	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	7	14.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
Organic Matter	EP004	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	15	6.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	36	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



Matrix: **SOIL** Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
<i>Analytical Methods</i>							
<b>Matrix Spikes (MS) - Continued</b>							
Total Metals by ICP-AES	EG005T	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	7	14.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH (1:5)	EA002	SOIL	(APHA 21st ed., 4500H+) pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM (2013) Schedule B(3) (Method 103)
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Particle Size Analysis (Sieving)	EA150	SOIL	Particle Size Analysis by Sieving according to AS1289.3.6.1 - 2009
Asbestos Identification in bulk solids	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples
Exchangeable Cations with pre-treatment	ED008	SOIL	Rayment & Higginson (1992) Method 15A2. Soluble salts are removed from the sample prior to analysis. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. This method is compliant with NEPM (2013) Schedule B(3) (Method 301)
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Organic Matter	EP004	SOIL	AS1289.4.1.1 - 1997., Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM (2013) Schedule B(3) (Method 105)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (2013) Schedule B(3) (Method 506.1)
Volatile Organic Compounds	EP074	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
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Preparation Methods	Method	Matrix	Method Descriptions
Exchangeable Cations Preparation Method	ED007PR	SOIL	Rayment & Higginson (1992) method 15A1. A 1M NH <sub>4</sub> Cl extraction by end over end tumbling at a ratio of 1:20. There is no pretreatment for soluble salts. Extracts can be run by ICP for cations.
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of distilled water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Organic Matter	EP004-PR	SOIL	AS1289.4.1.1 - 1997., Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM (2013) Schedule B(3) (Method 105)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option A - Concentrating)	ORG17A	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.



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## Summary of Outliers

### **Outliers : Quality Control Samples**

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### **Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes**

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.
- For all matrices, no Matrix Spike outliers occur.

#### **Regular Sample Surrogates**

- For all regular sample matrices, no surrogate recovery outliers occur.

### **Outliers : Analysis Holding Time Compliance**

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- No Analysis Holding Time Outliers exist.

### **Outliers : Frequency of Quality Control Samples**

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.
-

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

<b>Work Order</b>	: <b>ES1325900</b>		
<b>Client</b>	: <b>ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact Address</b>	: MR JONATHAN LEKAWSKI GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Contact Address</b>	: Barbara Hanna 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: jonathan.lekawski@erm.com	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: PROJECT SYMPHONY - MP	<b>Page</b>	: 1 of 3
<b>Order number</b>	: 0207423	<b>Quote number</b>	: ES2013ENVRES0370 (SY/278/13 V3)
<b>C-O-C number</b>	: ----	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b>	: ----		
<b>Sampler</b>	: TS		

#### Dates

Date Samples Received	: 28-NOV-2013	Issue Date	: 28-NOV-2013 18:51
Client Requested Due Date	: 05-DEC-2013	Scheduled Reporting Date	: <b>05-DEC-2013</b>

#### Delivery Details

Mode of Delivery	: Carrier	Temperature	: 16.8°C - Ice bricks present
No. of coolers/boxes	: 4 HARD	No. of samples received	: 13
Security Seal	: Not intact.	No. of samples analysed	: 10

#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Samples received in appropriately pretreated and preserved containers.
- Preliminary results will be available on the scheduled reporting date listed in this report. However the final report with PSD analysis will be complete on 12/12/13.
- **Samples received in appropriately pretreated and preserved containers.**
- **Asbestos and Particle Size analysis will be conducted by ALS Newcastle.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA002 pH (1:5)	SOIL - EA150* Particle Size Analysis by Sieving (Default sieves from SOIL - EA200	Asbestos Identification in Soils	SOIL - ED008 Exchangeable Cations with pre-treatment -All	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP004 (Carbon) Total Organic Carbon (Calc.)	SOIL - EP066 (solids) Polychlorinated Biphenyls by GC/MS
ES1325900-001	26-NOV-2013 15:00	MA_MW12_1.5	✓							
ES1325900-002	26-NOV-2013 15:00	MA_MW12_1.6	✓							
ES1325900-003	26-NOV-2013 15:00	MA_MW12_2.8						✓		✓
ES1325900-004	26-NOV-2013 15:00	MA_MW12_4.8	✓							
ES1325900-005	26-NOV-2013 15:00	MA_MW12_4.9-5.0		✓	✓		✓		✓	
ES1325900-006	26-NOV-2013 15:00	MB_MW02_15.7						✓		
ES1325900-007	26-NOV-2013 15:00	ML_SB40_0.1				✓		✓		
ES1325900-008	26-NOV-2013 15:00	ML_SB32_0.05				✓		✓		
ES1325900-009	26-NOV-2013 15:00	ML_SB30_0.1				✓		✓		
ES1325900-010	26-NOV-2013 15:00	ML_SB39_0.1				✓		✓		

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EP074 (solids) Volatile Organic Compounds	SOIL - S-18 (NO MOIST) TRH/(C6-C9)/BTEXN with No Moisture for TBs	SOIL - S-27 TRH/BTEXN/PAH/Phenols/8Metals
ES1325900-003	26-NOV-2013 15:00	MA_MW12_2.8	✓		✓
ES1325900-006	26-NOV-2013 15:00	MB_MW02_15.7			✓
ES1325900-007	26-NOV-2013 15:00	ML_SB40_0.1			✓
ES1325900-008	26-NOV-2013 15:00	ML_SB32_0.05			✓
ES1325900-009	26-NOV-2013 15:00	ML_SB30_0.1			✓
ES1325900-010	26-NOV-2013 15:00	ML_SB39_0.1			✓
ES1325900-011	26-NOV-2013 15:00	TRIP BLANK		✓	
ES1325900-012	20-NOV-2013 15:00	TRIP SPIKE		✓	
ES1325900-013	20-NOV-2013 15:00	TSC		✓	

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.





## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Attachment - Report ( SUBCO )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Attachment - Report ( SUBCO )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com



# CHAIN OF CUSTODY

ALS Laboratory:  
please tick →

ALS Laboratory is a member of the ALS Group of companies. The ALS Group is a leading provider of analytical services to the mining, metallurgical, environmental, and other industries. We are committed to providing our clients with the highest quality of service and the most accurate and reliable results.

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CLIENT: ERM  
OFFICE: Sydney  
PROJECT: Project Symphony - MP  
ORDER NUMBER: 0207423  
PROJECT MANAGER: Jonathan Lekawki  
SAMPLER: Tavona Shaw Gavin Powell  
COC emailed to ALST ( YES (NO)  
Email Reports to (will default to PM if no other addresses are listed): Symphony.DeltaWest@erm.com  
Email Invoice to (will default to PM if no other addresses are listed): Symphony.DeltaWest@erm.com  
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

TURNAROUND REQUIREMENTS:  Standard TAT (List due date):  
(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)  Non Standard or urgent TAT (List due date):  
ALS QUOTE NO.: SYZ7813

RELINQUISHED BY: **Tavona Shaw**  
DATE/TIME: **27.11.13 0635**

RECEIVED BY: **Don**  
DATE/TIME: **28/11 0830**

RELINQUISHED BY: **Don**  
DATE/TIME: **28/11 0830**

FOR LABORA  
Custody Seal (in receipt)  
Free Ice / frozen Random Sample  
Other comment

Environmental Division  
Sydney  
Work Order  
**ES1325900**

Telephone : + 61-2-8784 8555

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below)	TOTAL CONTAINERS	S-27 (8 metals - As, Cd, Cr, Cu, Ni, Pb, Zn, Hg, TRH/BTEX, PAH/Phenols)	Additional Metal - Se	TRH / BTEX / PAH / Phenol	Asbestos	VOC Scan	PCB	Particle Sizing (hydrometer), TOC -	pH, Exchangeable Cations plus ECEC	Additional Information
1	MA-MW12-1.5	26.11.13	Slit	1 jar + 1 bag	2	X	X	X	X	X	X	X	X	HOLD
2	MA-MW12-1.6			"	2	X	X	X	X	X	X	X	X	HOLD
3	MA-MW12-2.8			"	2	X	X	X	X	X	X	X	X	HOLD
4	MA-MW12-4.8			"	1	X	X	X	X	X	X	X	X	HOLD
5	MA-MW12-4.9-5.0			1 large bag	1	X	X	X	X	X	X	X	X	
6	MB-MW02-15-7			1 jar	1	X	X	X	X	X	X	X	X	
7	ML-8B40-0.1			1 jar, 1 bag	2	X	X	X	X	X	X	X	X	
8	ML-SB32-0.05			"	2	X	X	X	X	X	X	X	X	
9	ML-SB30-0.1			1 jar, 1 bag	2	X	X	X	X	X	X	X	X	
10	ML-SB39-0.1			"	2	X	X	X	X	X	X	X	X	
11	TRIP BLANK			1 jar	1	X	X	X	X	X	X	X	X	
12	TRIP SPICE	20.11.13		1 jar	1	X	X	X	X	X	X	X	X	
13	TRIP				19	6	6	6	4	1	1	1	1	

Water Contaminant Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORG = Nitric Preserved ORG; SH = Sodium Hydroxide Preserved Plastic; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airtight Unpreserved Plastic  
V = VOA Vial Preserved; VS = VOA Vial Sodium Disulphate Preserved; VAS = VOA Vial Sulphate Preserved; AV = Airtight Unpreserved Vial SQ = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;  
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Stieble Bottle; ASS = Plastic Bag for Acid Sulphate Solids; B = Unpreserved Bag.

## CERTIFICATE OF ANALYSIS

Work Order	: <b>ES1325970</b>	Page	: 1 of 17
Amendment	: <b>1</b>		
Client	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: PROJECT SYMPHONY	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 0207423		
C-O-C number	: ----	Date Samples Received	: 29-NOV-2013
Sampler	: T.SHAW	Issue Date	: 06-JAN-2014
Site	: ----		
Quote number	: SY/278/13 V3	No. of samples received	: 16
		No. of samples analysed	: 16

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EA200 Legend**
- **EA200 'Am' Amosite (brown asbestos)**
- **EA200 'Ch' Chrysotile (white asbestos)**
- **EA200 'Cr' Crocidolite (blue asbestos)**
- **EA200 'Trace' - Asbestos fibres detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres**
- **EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.**
- **EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.**
- **EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.**
- **EP080: The TRIP SPIKE and TRIP SPIKE CONTROL have been analysed for volatile TPH and BTEX only. The TRIP SPIKE and TRIP SPIKE CONTROL were prepared in the lab using reagent grade sand spiked with petrol. The TRIP SPIKE was dispatched from the lab and the TRIP SPIKE CONTROL retained. The spike samples were extracted and analysed concurrently with samples reported in this batch and results have been confirmed by re-extraction and re-analysis.**



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

## Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Peter Rennie	Asbestos Identifier	Newcastle - Asbestos
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Inorganics
		Sydney Organics
Raymond Commodor	Instrument Chemist	Sydney Inorganics



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_SB34_0.05	ML_SB22_0.05	ML_SB31_0.1	ML_SB29_0.1	MK_SB66_0.05
				27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325970-001	ES1325970-002	ES1325970-003	ES1325970-004	ES1325970-005
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	11.6	12.2	9.7	9.6	11.6
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No
Asbestos Type	1332-21-4	-	--	-	-	-	-	-
Sample weight (dry)	----	0.01	g	124	118	119	137	84.6
APPROVED IDENTIFIER:	----	-	--	P.RENNIE	P.RENNIE	P.RENNIE	P.RENNIE	P.RENNIE
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	15	7	7	8	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	9	12	7	4	9
Copper	7440-50-8	5	mg/kg	17	9	13	18	18
Lead	7439-92-1	5	mg/kg	21	24	17	24	11
Nickel	7440-02-0	2	mg/kg	40	10	22	19	7
Zinc	7440-66-6	5	mg/kg	81	66	64	62	62
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_SB34_0.05	ML_SB22_0.05	ML_SB31_0.1	ML_SB29_0.1	MK_SB66_0.05
				27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325970-001	ES1325970-002	ES1325970-003	ES1325970-004	ES1325970-005
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<b>0.5</b>	<b>1.2</b>	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<b>0.7</b>	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<b>0.5</b>	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<b>0.5</b>	<b>2.4</b>	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<b>240</b>	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<b>240</b>	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<b>60</b>	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<b>260</b>	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<b>320</b>	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<b>60</b>	<50



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_SB34_0.05	ML_SB22_0.05	ML_SB31_0.1	ML_SB29_0.1	MK_SB66_0.05
				27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325970-001	ES1325970-002	ES1325970-003	ES1325970-004	ES1325970-005
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	91.5	95.6	94.6	96.9	91.0
2-Chlorophenol-D4	93951-73-6	0.1	%	99.8	104	102	108	102
2,4,6-Tribromophenol	118-79-6	0.1	%	97.7	101	102	104	99.2
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	95.0	98.9	100	104	94.5
Anthracene-d10	1719-06-8	0.1	%	92.1	98.8	98.5	91.2	94.3
4-Terphenyl-d14	1718-51-0	0.1	%	86.0	87.6	90.7	90.6	85.0
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	94.0	107	101	89.1	98.3
Toluene-D8	2037-26-5	0.1	%	83.4	93.9	92.5	76.5	91.3
4-Bromofluorobenzene	460-00-4	0.1	%	92.1	106	99.3	78.9	98.1



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB67_0.05	MK_SB45_0.05	MK_SB64_0.05	MK_SB63_0.03	MD_MW03_2.0
				27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325970-006	ES1325970-007	ES1325970-008	ES1325970-009	ES1325970-010
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	25.5	23.4	13.6	9.5	19.4
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	----
Asbestos Type	1332-21-4	-	--	-	-	-	-	----
Sample weight (dry)	----	0.01	g	98.5	85.5	112	102	----
APPROVED IDENTIFIER:	----	-	--	P.RENNIE	P.RENNIE	P.RENNIE	P.RENNIE	----
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	<5	5	<5	<5	7
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	1	<1
Chromium	7440-47-3	2	mg/kg	6	47	9	24	8
Copper	7440-50-8	5	mg/kg	13	24	13	19	10
Lead	7439-92-1	5	mg/kg	16	12	12	10	26
Nickel	7440-02-0	2	mg/kg	11	24	7	14	3
Zinc	7440-66-6	5	mg/kg	52	70	51	131	13
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	----	----	----	----	<0.5
Isopropylbenzene	98-82-8	0.5	mg/kg	----	----	----	----	<0.5
n-Propylbenzene	103-65-1	0.5	mg/kg	----	----	----	----	<0.5
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	----	----	----	----	<0.5
sec-Butylbenzene	135-98-8	0.5	mg/kg	----	----	----	----	<0.5
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	----	----	----	----	<0.5
tert-Butylbenzene	98-06-6	0.5	mg/kg	----	----	----	----	<0.5
p-Isopropyltoluene	99-87-6	0.5	mg/kg	----	----	----	----	<0.5
n-Butylbenzene	104-51-8	0.5	mg/kg	----	----	----	----	<0.5
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	----	----	----	----	<5
2-Butanone (MEK)	78-93-3	5	mg/kg	----	----	----	----	<5
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	----	----	----	----	<5
2-Hexanone (MBK)	591-78-6	5	mg/kg	----	----	----	----	<5
<b>EP074C: Sulfonated Compounds</b>								





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB67_0.05	MK_SB45_0.05	MK_SB64_0.05	MK_SB63_0.03	MD_MW03_2.0
				27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325970-006	ES1325970-007	ES1325970-008	ES1325970-009	ES1325970-010
<b>EP074C: Sulfonated Compounds - Continued</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	----	----	----	----	<0.5
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	----	----	----	----	<0.5
1,2-Dichloropropane	78-87-5	0.5	mg/kg	----	----	----	----	<0.5
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	----	----	----	----	<0.5
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	----	----	----	----	<0.5
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	----	----	----	----	<0.5
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	----	----	----	----	<5
Chloromethane	74-87-3	5	mg/kg	----	----	----	----	<5
Vinyl chloride	75-01-4	5	mg/kg	----	----	----	----	<5
Bromomethane	74-83-9	5	mg/kg	----	----	----	----	<5
Chloroethane	75-00-3	5	mg/kg	----	----	----	----	<5
Trichlorofluoromethane	75-69-4	5	mg/kg	----	----	----	----	<5
1,1-Dichloroethene	75-35-4	0.5	mg/kg	----	----	----	----	<0.5
Iodomethane	74-88-4	0.5	mg/kg	----	----	----	----	<0.5
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	----	----	----	----	<0.5
1,1-Dichloroethane	75-34-3	0.5	mg/kg	----	----	----	----	<0.5
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	----	----	----	----	<0.5
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	----	----	----	----	<0.5
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	----	----	----	----	<0.5
Carbon Tetrachloride	56-23-5	0.5	mg/kg	----	----	----	----	<0.5
1,2-Dichloroethane	107-06-2	0.5	mg/kg	----	----	----	----	<0.5
Trichloroethene	79-01-6	0.5	mg/kg	----	----	----	----	<0.5
Dibromomethane	74-95-3	0.5	mg/kg	----	----	----	----	<0.5
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	----	----	----	----	<0.5
1,3-Dichloropropane	142-28-9	0.5	mg/kg	----	----	----	----	<0.5
Tetrachloroethene	127-18-4	0.5	mg/kg	----	----	----	----	<0.5
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	----	----	----	----	<0.5
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	----	----	----	----	<0.5
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	----	----	----	----	<0.5
1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	----	----	----	----	<0.5
1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	----	----	----	----	<0.5
Pentachloroethane	76-01-7	0.5	mg/kg	----	----	----	----	<0.5



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB67_0.05	MK_SB45_0.05	MK_SB64_0.05	MK_SB63_0.03	MD_MW03_2.0
				27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325970-006	ES1325970-007	ES1325970-008	ES1325970-009	ES1325970-010
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	----	----	----	----	<0.5
Hexachlorobutadiene	87-68-3	0.5	mg/kg	----	----	----	----	<0.5
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	----	----	----	----	<0.5
Bromobenzene	108-86-1	0.5	mg/kg	----	----	----	----	<0.5
2-Chlorotoluene	95-49-8	0.5	mg/kg	----	----	----	----	<0.5
4-Chlorotoluene	106-43-4	0.5	mg/kg	----	----	----	----	<0.5
1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	----	----	----	----	<0.5
1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	----	----	----	----	<0.5
1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	----	----	----	----	<0.5
1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	----	----	----	----	<0.5
1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	----	----	----	----	<0.5
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	----	----	----	----	<0.5
Bromodichloromethane	75-27-4	0.5	mg/kg	----	----	----	----	<0.5
Dibromochloromethane	124-48-1	0.5	mg/kg	----	----	----	----	<0.5
Bromoform	75-25-2	0.5	mg/kg	----	----	----	----	<0.5
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	5	mg/kg	----	----	----	----	<5
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB67_0.05	MK_SB45_0.05	MK_SB64_0.05	MK_SB63_0.03	MD_MW03_2.0
				27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325970-006	ES1325970-007	ES1325970-008	ES1325970-009	ES1325970-010
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MK_SB67_0.05	MK_SB45_0.05	MK_SB64_0.05	MK_SB63_0.03	MD_MW03_2.0
				27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325970-006	ES1325970-007	ES1325970-008	ES1325970-009	ES1325970-010
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 - Continued</b>								
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	----	----	----	107
Toluene-D8	2037-26-5	0.1	%	----	----	----	----	111
4-Bromofluorobenzene	460-00-4	0.1	%	----	----	----	----	98.4
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	91.5	94.2	89.2	87.0	91.0
2-Chlorophenol-D4	93951-73-6	0.1	%	98.3	102	101	96.8	98.5
2,4,6-Tribromophenol	118-79-6	0.1	%	95.2	96.2	99.6	88.6	90.0
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	95.8	98.5	95.4	91.1	95.3
Anthracene-d10	1719-06-8	0.1	%	92.7	96.9	94.6	90.2	90.4
4-Terphenyl-d14	1718-51-0	0.1	%	82.9	87.3	86.6	80.5	85.5
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	96.8	98.4	103	100	112
Toluene-D8	2037-26-5	0.1	%	85.3	86.1	89.8	90.5	104
4-Bromofluorobenzene	460-00-4	0.1	%	91.5	94.7	98.8	97.2	101



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MD_MW03_3.8	MK_SB75_0.05	MK_SB69_0.05	TRIP BLANK	TRIP SPIKE
				27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00	20-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325970-011	ES1325970-012	ES1325970-013	ES1325970-014	ES1325970-015
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	----	1.0	%	16.5	6.7	10.7	----	----
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	----	No	No	----	----
Asbestos Type	1332-21-4	-	--	----	-	-	----	----
Sample weight (dry)	----	0.01	g	----	68.9	91.6	----	----
APPROVED IDENTIFIER:	----	-	--	----	P.RENNIE	P.RENNIE	----	----
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	----	----
Arsenic	7440-38-2	5	mg/kg	15	6	<5	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	----	----
Chromium	7440-47-3	2	mg/kg	12	14	31	----	----
Copper	7440-50-8	5	mg/kg	22	17	18	----	----
Lead	7439-92-1	5	mg/kg	42	20	10	----	----
Nickel	7440-02-0	2	mg/kg	25	18	17	----	----
Zinc	7440-66-6	5	mg/kg	47	68	77	----	----
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	----	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Styrene	100-42-5	0.5	mg/kg	<0.5	----	----	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	----	----	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	----	----	----	----
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	----	----	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	----	----	----	----
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	----	----	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	----	----	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	----	----	----	----
n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	----	----	----	----
<b>EP074B: Oxygenated Compounds</b>								
Vinyl Acetate	108-05-4	5	mg/kg	<5	----	----	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	----	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	----	----	----	----
2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	----	----	----	----
<b>EP074C: Sulfonated Compounds</b>								



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MD_MW03_3.8	MK_SB75_0.05	MK_SB69_0.05	TRIP BLANK	TRIP SPIKE
				27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00	20-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325970-011	ES1325970-012	ES1325970-013	ES1325970-014	ES1325970-015
<b>EP074C: Sulfonated Compounds - Continued</b>								
Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	----	----	----	----
<b>EP074D: Fumigants</b>								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	----	----	----	----
1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	----	----	----	----
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	----	----	----	----
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	----	----	----	----
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	----	----	----	----
<b>EP074E: Halogenated Aliphatic Compounds</b>								
Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	----	----	----	----
Chloromethane	74-87-3	5	mg/kg	<5	----	----	----	----
Vinyl chloride	75-01-4	5	mg/kg	<5	----	----	----	----
Bromomethane	74-83-9	5	mg/kg	<5	----	----	----	----
Chloroethane	75-00-3	5	mg/kg	<5	----	----	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg	<5	----	----	----	----
1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	----	----	----	----
Iodomethane	74-88-4	0.5	mg/kg	<0.5	----	----	----	----
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	----	----	----	----
1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	----	----	----	----
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	----	----	----	----
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	----	----	----	----
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	----	----	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	----	----	----	----
1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	----	----	----	----
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	----	----	----	----
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	----	----	----	----
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	----	----	----	----
1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	----	----	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	----	----	----	----
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	----	----	----	----
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	----	----	----	----
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	----	----	----	----
1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	----	----	----	----
1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	----	----	----	----
Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	----	----	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MD_MW03_3.8	MK_SB75_0.05	MK_SB69_0.05	TRIP BLANK	TRIP SPIKE
				27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00	20-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325970-011	ES1325970-012	ES1325970-013	ES1325970-014	ES1325970-015
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>								
1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	----	----	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	----	----	----	----
<b>EP074F: Halogenated Aromatic Compounds</b>								
Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	----	----	----	----
Bromobenzene	108-86-1	0.5	mg/kg	<0.5	----	----	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	----	----	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	----	----	----	----
1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	----	----	----	----
1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	----	----	----	----
1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	----	----	----	----
1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	----	----	----	----
1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	----	----	----	----
<b>EP074G: Trihalomethanes</b>								
Chloroform	67-66-3	0.5	mg/kg	<0.5	----	----	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	----	----	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	----	----	----	----
Bromoform	75-25-2	0.5	mg/kg	<0.5	----	----	----	----
<b>EP074H: Naphthalene</b>								
Naphthalene	91-20-3	5	mg/kg	<5	----	----	----	----
<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MD_MW03_3.8	MK_SB75_0.05	MK_SB69_0.05	TRIP BLANK	TRIP SPIKE
				27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00	20-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325970-011	ES1325970-012	ES1325970-013	ES1325970-014	ES1325970-015
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	----	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	----	----





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				MD_MW03_3.8	MK_SB75_0.05	MK_SB69_0.05	TRIP BLANK	TRIP SPIKE
				27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00	27-NOV-2013 15:00	20-NOV-2013 15:00
Compound	CAS Number	LOR	Unit	ES1325970-011	ES1325970-012	ES1325970-013	ES1325970-014	ES1325970-015
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 - Continued</b>								
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	----	----
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	1.7
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	0.9
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	2.6
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	0.9
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
<b>EP074S: VOC Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	106	----	----	----	----
Toluene-D8	2037-26-5	0.1	%	111	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	97.7	----	----	----	----
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	92.1	84.4	85.9	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	101	91.8	96.4	----	----
2,4,6-Tribromophenol	118-79-6	0.1	%	94.5	88.9	89.8	----	----
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	97.3	90.2	93.0	----	----
Anthracene-d10	1719-06-8	0.1	%	94.2	91.5	91.7	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	87.2	87.4	81.8	----	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	111	100	98.2	106	105
Toluene-D8	2037-26-5	0.1	%	104	88.5	88.6	92.0	97.1
4-Bromofluorobenzene	460-00-4	0.1	%	99.5	98.6	96.9	103	98.3



## Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)

Client sample ID

				TSC	---	---	---	---
				20-NOV-2013 15:00	---	---	---	---
Compound	CAS Number	LOR	Unit	ES1325970-016	---	---	---	---
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
<b>C6 - C9 Fraction</b>	---	10	mg/kg	<b>54</b>	---	---	---	---
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
<b>C6 - C10 Fraction</b>	C6_C10	10	mg/kg	<b>63</b>	---	---	---	---
<b>C6 - C10 Fraction minus BTEX (F1)</b>	C6_C10-BTEX	10	mg/kg	<b>34</b>	---	---	---	---
<b>EP080: BTEXN</b>								
<b>Benzene</b>	71-43-2	0.2	mg/kg	<b>0.4</b>	---	---	---	---
<b>Toluene</b>	108-88-3	0.5	mg/kg	<b>14.0</b>	---	---	---	---
<b>Ethylbenzene</b>	100-41-4	0.5	mg/kg	<b>1.8</b>	---	---	---	---
<b>meta- &amp; para-Xylene</b>	108-38-3 106-42-3	0.5	mg/kg	<b>8.7</b>	---	---	---	---
<b>ortho-Xylene</b>	95-47-6	0.5	mg/kg	<b>3.6</b>	---	---	---	---
<b>Sum of BTEX</b>	---	0.2	mg/kg	<b>28.5</b>	---	---	---	---
<b>Total Xylenes</b>	1330-20-7	0.5	mg/kg	<b>12.3</b>	---	---	---	---
<b>Naphthalene</b>	91-20-3	1	mg/kg	<b>&lt;1</b>	---	---	---	---
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
<b>1,2-Dichloroethane-D4</b>	17060-07-0	0.1	%	<b>94.9</b>	---	---	---	---
<b>Toluene-D8</b>	2037-26-5	0.1	%	<b>84.2</b>	---	---	---	---
<b>4-Bromofluorobenzene</b>	460-00-4	0.1	%	<b>93.9</b>	---	---	---	---

## Analytical Results

### Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>		
EA200: Description	ML_SB34_0.05 - 27-NOV-2013 15:00	Grey-brown soil with some vegetation and small concrete and coal pieces
EA200: Description	ML_SB22_0.05 - 27-NOV-2013 15:00	Light brown soil with some vegetation and small brown rocks and charcoal pieces
EA200: Description	ML_SB31_0.1 - 27-NOV-2013 15:00	Grey-brown soil with some vegetation and small orange-brown rocks and concrete and coal pieces
EA200: Description	ML_SB29_0.1 - 27-NOV-2013 15:00	Grey-brown soil with some vegetation and small orange-brown rocks and concrete and coal pieces
EA200: Description	MK_SB66_0.05 - 27-NOV-2013 15:00	Brown soil with some vegetation and small white rocks and coal pieces
EA200: Description	MK_SB67_0.05 - 27-NOV-2013 15:00	Brown soil with some vegetation and small white rocks and coal pieces
EA200: Description	MK_SB45_0.05 - 27-NOV-2013 15:00	Brown soil with large quantity vegetation
EA200: Description	MK_SB64_0.05 - 27-NOV-2013 15:00	Dark brown soil with large quantity vegetation
EA200: Description	MK_SB63_0.03 - 27-NOV-2013 15:00	Brown soil with large quantity vegetation
EA200: Description	MK_SB75_0.05 - 27-NOV-2013 15:00	Brown soil with large quantity vegetation and small charcoal pieces
EA200: Description	MK_SB69_0.05 - 27-NOV-2013 15:00	Brown soil with large quantity vegetation and small grey rocks and charcoal pieces



## Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP074S: VOC Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	64	130
Toluene-D8	2037-26-5	66	136
4-Bromofluorobenzene	460-00-4	60	122
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

## QUALITY CONTROL REPORT

Work Order	: <b>ES1325970</b>	Page	: 1 of 16
Amendment	: <b>1</b>		
Client	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: PROJECT SYMPHONY	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 29-NOV-2013
Sampler	: T.SHAW	Issue Date	: 06-JAN-2014
Order number	: 0207423		
Quote number	: SY/278/13 V3	No. of samples received	: 16
		No. of samples analysed	: 16

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :  
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
RPD = Relative Percentage Difference  
# = Indicates failed QC



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

## Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Peter Rennie	Asbestos Identifier	Newcastle - Asbestos
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Inorganics Sydney Organics
Raymond Commodor	Instrument Chemist	Sydney Inorganics



## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EA055: Moisture Content (QC Lot: 3193604)</b>									
ES1325969-017	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	14.6	13.6	6.5	0% - 50%
ES1325970-011	MD_MW03_3.8	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	16.5	17.6	6.0	0% - 50%
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3192453)</b>									
ES1325412-003	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	43	49	13.7	0% - 20%
		EG005T: Chromium	7440-47-3	2	mg/kg	66	77	15.7	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	34	36	0.0	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	9	9	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	144	158	9.5	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	2440	2820	14.4	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	17200	20500	17.6	0% - 20%
ES1325968-002	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	27	19	37.1	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	12	13	9.6	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	13	11	17.7	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	19	15	21.7	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	18	16	9.5	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	71	84	16.2	0% - 50%
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3192455)</b>									
ES1325970-004	ML_SB29_0.1	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	4	4	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	19	21	9.9	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	8	6	18.3	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	18	22	16.4	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	24	25	4.4	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	62	64	2.9	0% - 50%
ES1326071-002	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	13	13	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	6	6	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	7	8	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	16	19	14.7	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	28	26	6.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	82	82	0.0	0% - 50%



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3192454)</b>									
ES1325412-003	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	1.3	1.4	9.9	0% - 50%
ES1325968-002	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3192456)</b>									
ES1325970-004	ML_SB29_0.1	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1326071-002	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3187746)</b>									
ES1325970-010	MD_MW03_2.0	EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074B: Oxygenated Compounds (QC Lot: 3187746)</b>									
ES1325970-010	MD_MW03_2.0	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.0	No Limit
<b>EP074C: Sulfonated Compounds (QC Lot: 3187746)</b>									
ES1325970-010	MD_MW03_2.0	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074D: Fumigants (QC Lot: 3187746)</b>									
ES1325970-010	MD_MW03_2.0	EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3187746)</b>									
ES1325970-010	MD_MW03_2.0	EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 3187746) - continued</b>									
ES1325970-010	MD_MW03_2.0	EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.0	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.0	No Limit
EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.0	No Limit		
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.0	No Limit		
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 3187746)</b>									
ES1325970-010	MD_MW03_2.0	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074G: Trihalomethanes (QC Lot: 3187746)</b>									
ES1325970-010	MD_MW03_2.0	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
<b>EP074H: Naphthalene (QC Lot: 3187746)</b>									
ES1325970-010	MD_MW03_2.0	EP074: Naphthalene	91-20-3	5	mg/kg	<5	<5	0.0	No Limit
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3187755)</b>									
ES1325970-001	ML_SB34_0.05	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit





Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3187755) - continued</b>									
ES1325970-001	ML_SB34_0.05	EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
ES1325970-010	MD_MW03_2.0	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3187755)</b>									
ES1325970-001	ML_SB34_0.05	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1,2,3-cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3187755) - continued</b>									
ES1325970-010	MD_MW03_2.0	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3187745)</b>									
ES1325970-010	MD_MW03_2.0	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1325970-012	MK_SB75_0.05	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3187754)</b>									
ES1325970-001	ML_SB34_0.05	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1325970-010	MD_MW03_2.0	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3187745)</b>									
ES1325970-010	MD_MW03_2.0	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES1325970-012	MK_SB75_0.05	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3187754)</b>									
ES1325970-001	ML_SB34_0.05	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
ES1325970-010	MD_MW03_2.0	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080: BTEXN (QC Lot: 3187745)</b>									



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP080: BTEXN (QC Lot: 3187745) - continued</b>									
ES1325970-010	MD_MW03_2.0	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES1325970-012	MK_SB75_0.05	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit



### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3192453)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	99.1	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	89.2	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	95.4	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	102	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	87.9	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	99.6	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	112	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	91.0	81	133	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3192455)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	108	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	99.8	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	106	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	107	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	103	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	112	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	115	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	110	81	133	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3192454)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	75.5	66	112	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3192456)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	70.9	66	112	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3187746)</b>									
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	88.4	64	126	
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	88.6	66	128	
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	84.9	63	129	
EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	85.2	63	129	
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	88.3	64	130	
EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	86.8	63	129	
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	84.6	63	129	
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	87.4	62	130	
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	87.6	61	131	
<b>EP074B: Oxygenated Compounds (QCLot: 3187746)</b>									
EP074: Vinyl Acetate	108-05-4	1	mg/kg	----	10 mg/kg	75.5	29.6	156	
		5	mg/kg	<5	----	----	----	----	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074B: Oxygenated Compounds (QCLot: 3187746) - continued</b>									
EP074: 2-Butanone (MEK)	78-93-3	1	mg/kg	----	10 mg/kg	110	58	136	
		5	mg/kg	<5	----	----	----	----	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	1	mg/kg	----	10 mg/kg	98.9	54	138	
		5	mg/kg	<5	----	----	----	----	
EP074: 2-Hexanone (MBK)	591-78-6	1	mg/kg	----	10 mg/kg	103	54	136	
		5	mg/kg	<5	----	----	----	----	
<b>EP074C: Sulfonated Compounds (QCLot: 3187746)</b>									
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	58.6	54	126	
<b>EP074D: Fumigants (QCLot: 3187746)</b>									
EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	72.7	55	133	
EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	87.5	69	127	
EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	94.6	54	124	
EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	85.6	51	125	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	91.7	66	126	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3187746)</b>									
EP074: Dichlorodifluoromethane	75-71-8	1	mg/kg	----	10 mg/kg	33.2	30	148	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloromethane	74-87-3	1	mg/kg	----	10 mg/kg	55.1	41	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Vinyl chloride	75-01-4	1	mg/kg	----	10 mg/kg	67.1	43	147	
		5	mg/kg	<5	----	----	----	----	
EP074: Bromomethane	74-83-9	1	mg/kg	----	10 mg/kg	63.1	47	141	
		5	mg/kg	<5	----	----	----	----	
EP074: Chloroethane	75-00-3	1	mg/kg	----	10 mg/kg	64.2	49	143	
		5	mg/kg	<5	----	----	----	----	
EP074: Trichlorofluoromethane	75-69-4	1	mg/kg	----	10 mg/kg	70.7	49	135	
		5	mg/kg	<5	----	----	----	----	
EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	71.8	54	126	
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	71.7	43	129	
EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	77.1	62	130	
EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	83.0	66	132	
EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	83.7	66	132	
EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	73.7	62	126	
EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	83.4	64	128	
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	80.4	59	125	
EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	97.2	65	123	
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	85.6	64	120	
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	90.5	65	127	
EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	101	70	130	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3187746) - continued</b>									
EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	94.2	72	128	
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	89.8	67	143	
EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	81.5	62	122	
EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	95.1	54	128	
EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	92.9	55	129	
EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	99.0	56	132	
EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	107	65	135	
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	90.6	19.8	134	
EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	89.7	53	129	
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	87.1	48	136	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3187746)</b>									
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	89.9	70	128	
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	87.1	67	127	
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	87.7	64	130	
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	88.2	62	130	
EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	89.7	63	129	
EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	88.9	63	129	
EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	89.3	66	128	
EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	82.4	54	134	
EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	89.8	60	132	
<b>EP074G: Trihalomethanes (QCLot: 3187746)</b>									
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	83.0	62	120	
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	85.5	61	121	
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	88.9	63	121	
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	97.2	60	126	
<b>EP074H: Naphthalene (QCLot: 3187746)</b>									
EP074: Naphthalene	91-20-3	0.5	mg/kg	----	1 mg/kg	90.0	63	133	
		5	mg/kg	<5	----	----	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3187755)</b>									
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	89.6	74	116	
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	91.4	74	116	
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	90.0	72	116	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	93.7	69	123	
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	83.9	60.3	117	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	87.7	69	117	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	89.4	68	112	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	90.6	73	117	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	83.6	76.4	114	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3187755) - continued</b>									
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	84.6	57	111	
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	84.5	68.9	112	
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	31.3	3.9	57	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3187755)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	92.0	80	124	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	98.1	77	123	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	97.3	79	123	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	99.0	77	123	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	101	79	123	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	102	79	123	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	104	79	123	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	104	79	125	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	89.2	73	121	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	103	81	123	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	83.6	70	118	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	99.6	77	123	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	93.6	76	122	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	85.8	71	113	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	84.1	71.7	113	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	86.1	72.4	114	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3187745)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	68.6	68.4	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3187754)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	115	71	131	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	110	74	138	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	93.4	64	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3187745)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	70.7	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3187754)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	114	70	130	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	104	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	
		50	mg/kg	----	150 mg/kg	73.7	63	131	
<b>EP080: BTEXN (QCLot: 3187745)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	74.0	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	80.8	62	128	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	77.8	58	118	





Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
<b>EP080: BTEXN (QCLot: 3187745) - continued</b>								
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	79.2	60	120
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	87.1	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	92.9	62	138

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%) Low High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3192453)</b>							
ES1325412-003	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	102	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	87.8	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	94.1	70	130
		EG005T: Copper	7440-50-8	125 mg/kg	120	70	130
		EG005T: Lead	7439-92-1	125 mg/kg	# Not Determined	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	83.8	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	105	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	# Not Determined	70	130
<b>EG005T: Total Metals by ICP-AES (QCLot: 3192455)</b>							
ES1325970-004	ML_SB29_0.1	EG005T: Arsenic	7440-38-2	50 mg/kg	102	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	105	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	105	70	130
		EG005T: Copper	7440-50-8	125 mg/kg	105	70	130
		EG005T: Lead	7439-92-1	125 mg/kg	108	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	102	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	108	70	130
		EG005T: Zinc	7440-66-6	125 mg/kg	100	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3192454)</b>							
ES1325412-003	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	104	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3192456)</b>							
ES1325970-004	ML_SB29_0.1	EG035T: Mercury	7439-97-6	5 mg/kg	77.6	70	130
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3187746)</b>							
ES1325970-010	MD_MW03_2.0	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	91.4	70	130





Sub-Matrix: SOIL				Matrix Spike (MS) Report				
				Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3187746) - continued</b>								
ES1325970-010	MD_MW03_2.0	EP074: Trichloroethene	79-01-6	2.5 mg/kg	106	70	130	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3187746)</b>								
ES1325970-010	MD_MW03_2.0	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	111	70	130	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3187755)</b>								
ES1325970-001	ML_SB34_0.05	EP075(SIM): Phenol	108-95-2	10 mg/kg	81.3	70	130	
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	84.0	70	130	
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	82.2	60	130	
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	75.1	70	130	
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	62.9	20	130	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3187755)</b>								
ES1325970-001	ML_SB34_0.05	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	85.4	70	130	
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	90.1	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3187745)</b>								
ES1325970-010	MD_MW03_2.0	EP080: C6 - C9 Fraction	----	32.5 mg/kg	83.3	70	130	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3187754)</b>								
ES1325970-001	ML_SB34_0.05	EP071: C10 - C14 Fraction	----	640 mg/kg	84.9	73	137	
		EP071: C15 - C28 Fraction	----	3140 mg/kg	79.6	53	131	
		EP071: C29 - C36 Fraction	----	2860 mg/kg	68.7	52	132	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3187745)</b>								
ES1325970-010	MD_MW03_2.0	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	81.6	70	130	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3187754)</b>								
ES1325970-001	ML_SB34_0.05	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	103	73	137	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	72.8	53	131	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	53.0	52	132	
<b>EP080: BTEXN (QCLot: 3187745)</b>								
ES1325970-010	MD_MW03_2.0	EP080: Benzene	71-43-2	2.5 mg/kg	73.6	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	73.8	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	80.2	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	81.6	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	83.5	70	130	
	EP080: Naphthalene	91-20-3	2.5 mg/kg	91.9	70	130		

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.



Sub-Matrix: SOIL					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
						MS	MSD	Low	High	Value	Control Limit
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number								
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3187745)</b>											
ES1325970-010	MD_MW03_2.0	EP080: C6 - C9 Fraction	----	32.5 mg/kg	83.3	----	70	130	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3187745)</b>											
ES1325970-010	MD_MW03_2.0	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	81.6	----	70	130	----	----	
<b>EP080: BTEXN (QCLot: 3187745)</b>											
ES1325970-010	MD_MW03_2.0	EP080: Benzene	71-43-2	2.5 mg/kg	73.6	----	70	130	----	----	
		EP080: Toluene	108-88-3	2.5 mg/kg	73.8	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	80.2	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	81.6	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	83.5	----	70	130	----	----	
		EP080: Naphthalene	91-20-3	2.5 mg/kg	91.9	----	70	130	----	----	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 3187746)</b>											
ES1325970-010	MD_MW03_2.0	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	91.4	----	70	130	----	----	
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	106	----	70	130	----	----	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 3187746)</b>											
ES1325970-010	MD_MW03_2.0	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	111	----	70	130	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3187754)</b>											
ES1325970-001	ML_SB34_0.05	EP071: C10 - C14 Fraction	----	640 mg/kg	84.9	----	73	137	----	----	
		EP071: C15 - C28 Fraction	----	3140 mg/kg	79.6	----	53	131	----	----	
		EP071: C29 - C36 Fraction	----	2860 mg/kg	68.7	----	52	132	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3187754)</b>											
ES1325970-001	ML_SB34_0.05	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	103	----	73	137	----	----	
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	72.8	----	53	131	----	----	
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	53.0	----	52	132	----	----	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3187755)</b>											
ES1325970-001	ML_SB34_0.05	EP075(SIM): Phenol	108-95-2	10 mg/kg	81.3	----	70	130	----	----	
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	84.0	----	70	130	----	----	
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	82.2	----	60	130	----	----	
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	75.1	----	70	130	----	----	
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	62.9	----	20	130	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3187755)</b>											
ES1325970-001	ML_SB34_0.05	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	85.4	----	70	130	----	----	
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	90.1	----	70	130	----	----	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3192453)</b>											
ES1325412-003	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	102	----	70	130	----	----	
		EG005T: Cadmium	7440-43-9	50 mg/kg	87.8	----	70	130	----	----	
		EG005T: Chromium	7440-47-3	50 mg/kg	94.1	----	70	130	----	----	



Sub-Matrix: SOIL

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
<b>EG005T: Total Metals by ICP-AES (QCLot: 3192453) - continued</b>										
ES1325412-003	Anonymous	EG005T: Copper	7440-50-8	125 mg/kg	120	----	70	130	----	----
		EG005T: Lead	7439-92-1	125 mg/kg	# Not Determined	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	83.8	----	70	130	----	----
		EG005T: Selenium	7782-49-2	50 mg/kg	105	----	70	130	----	----
		EG005T: Zinc	7440-66-6	250 mg/kg	# Not Determined	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3192454)</b>										
ES1325412-003	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	104	----	70	130	----	----
<b>EG005T: Total Metals by ICP-AES (QCLot: 3192455)</b>										
ES1325970-004	ML_SB29_0.1	EG005T: Arsenic	7440-38-2	50 mg/kg	102	----	70	130	----	----
		EG005T: Cadmium	7440-43-9	50 mg/kg	105	----	70	130	----	----
		EG005T: Chromium	7440-47-3	50 mg/kg	105	----	70	130	----	----
		EG005T: Copper	7440-50-8	125 mg/kg	105	----	70	130	----	----
		EG005T: Lead	7439-92-1	125 mg/kg	108	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	102	----	70	130	----	----
		EG005T: Selenium	7782-49-2	50 mg/kg	108	----	70	130	----	----
		EG005T: Zinc	7440-66-6	125 mg/kg	100	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3192456)</b>										
ES1325970-004	ML_SB29_0.1	EG035T: Mercury	7439-97-6	5 mg/kg	77.6	----	70	130	----	----

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1325970</b>	Page	: 1 of 7
Amendment	: <b>1</b>		
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: PROJECT SYMPHONY	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 29-NOV-2013
Sampler	: T.SHAW	Issue Date	: 06-JAN-2014
Order number	: 0207423		
Quote number	: SY/278/13 V3	No. of samples received	: 16
		No. of samples analysed	: 16

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EA055: Moisture Content</b>								
<b>Soil Glass Jar - Unpreserved (EA055-103)</b>								
ML_SB34_0.05, ML_SB31_0.1, MK_SB66_0.05, MK_SB45_0.05, MK_SB63_0.03, MD_MW03_3.8, MK_SB69_0.05	ML_SB22_0.05, ML_SB29_0.1, MK_SB67_0.05, MK_SB64_0.05, MD_MW03_2.0, MK_SB75_0.05	27-NOV-2013	----	----	----	04-DEC-2013	11-DEC-2013	✓
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
<b>Snap Lock Bag (EA200)</b>								
ML_SB34_0.05, ML_SB31_0.1, MK_SB66_0.05, MK_SB45_0.05, MK_SB63_0.03, MK_SB69_0.05	ML_SB22_0.05, ML_SB29_0.1, MK_SB67_0.05, MK_SB64_0.05, MK_SB75_0.05	27-NOV-2013	---	26-MAY-2014	----	10-DEC-2013	08-JUN-2014	✓
<b>EG005T: Total Metals by ICP-AES</b>								
<b>Soil Glass Jar - Unpreserved (EG005T)</b>								
ML_SB34_0.05, ML_SB31_0.1, MK_SB66_0.05, MK_SB45_0.05, MK_SB63_0.03, MD_MW03_3.8, MK_SB69_0.05	ML_SB22_0.05, ML_SB29_0.1, MK_SB67_0.05, MK_SB64_0.05, MD_MW03_2.0, MK_SB75_0.05	27-NOV-2013	04-DEC-2013	26-MAY-2014	✓	04-DEC-2013	26-MAY-2014	✓



Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
<b>Soil Glass Jar - Unpreserved (EG035T)</b> ML_SB34_0.05, ML_SB31_0.1, MK_SB66_0.05, MK_SB45_0.05, MK_SB63_0.03, MD_MW03_3.8, MK_SB69_0.05 ML_SB22_0.05, ML_SB29_0.1, MK_SB67_0.05, MK_SB64_0.05, MD_MW03_2.0, MK_SB75_0.05	27-NOV-2013	04-DEC-2013	25-DEC-2013	✓	06-DEC-2013	25-DEC-2013	✓	
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP071)</b> ML_SB34_0.05, ML_SB31_0.1, MK_SB66_0.05, MK_SB45_0.05, MK_SB63_0.03, MD_MW03_3.8, MK_SB69_0.05 ML_SB22_0.05, ML_SB29_0.1, MK_SB67_0.05, MK_SB64_0.05, MD_MW03_2.0, MK_SB75_0.05	27-NOV-2013	05-DEC-2013	11-DEC-2013	✓	05-DEC-2013	14-JAN-2014	✓	
<b>EP074D: Fumigants</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MD_MW03_2.0, MD_MW03_3.8	27-NOV-2013	03-DEC-2013	04-DEC-2013	✓	04-DEC-2013	04-DEC-2013	✓	
<b>EP074E: Halogenated Aliphatic Compounds</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MD_MW03_2.0, MD_MW03_3.8	27-NOV-2013	03-DEC-2013	04-DEC-2013	✓	04-DEC-2013	04-DEC-2013	✓	
<b>EP074F: Halogenated Aromatic Compounds</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MD_MW03_2.0, MD_MW03_3.8	27-NOV-2013	03-DEC-2013	04-DEC-2013	✓	04-DEC-2013	04-DEC-2013	✓	
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MD_MW03_2.0, MD_MW03_3.8	27-NOV-2013	03-DEC-2013	04-DEC-2013	✓	04-DEC-2013	04-DEC-2013	✓	
<b>EP074H: Naphthalene</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MD_MW03_2.0, MD_MW03_3.8	27-NOV-2013	03-DEC-2013	04-DEC-2013	✓	04-DEC-2013	04-DEC-2013	✓	
<b>EP074B: Oxygenated Compounds</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MD_MW03_2.0, MD_MW03_3.8	27-NOV-2013	03-DEC-2013	04-DEC-2013	✓	04-DEC-2013	04-DEC-2013	✓	
<b>EP074C: Sulfonated Compounds</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MD_MW03_2.0, MD_MW03_3.8	27-NOV-2013	03-DEC-2013	04-DEC-2013	✓	04-DEC-2013	04-DEC-2013	✓	
<b>EP074G: Trihalomethanes</b>								
<b>Soil Glass Jar - Unpreserved (EP074)</b> MD_MW03_2.0, MD_MW03_3.8	27-NOV-2013	03-DEC-2013	04-DEC-2013	✓	04-DEC-2013	04-DEC-2013	✓	



Matrix: **SOIL** Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP075(SIM)A: Phenolic Compounds</b>								
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b>								
ML_SB34_0.05, ML_SB31_0.1, MK_SB66_0.05, MK_SB45_0.05, MK_SB63_0.03, MD_MW03_3.8, MK_SB69_0.05	ML_SB22_0.05, ML_SB29_0.1, MK_SB67_0.05, MK_SB64_0.05, MD_MW03_2.0, MK_SB75_0.05	27-NOV-2013	05-DEC-2013	11-DEC-2013	✓	05-DEC-2013	14-JAN-2014	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
<b>Soil Glass Jar - Unpreserved (EP075(SIM))</b>								
ML_SB34_0.05, ML_SB31_0.1, MK_SB66_0.05, MK_SB45_0.05, MK_SB63_0.03, MD_MW03_3.8, MK_SB69_0.05	ML_SB22_0.05, ML_SB29_0.1, MK_SB67_0.05, MK_SB64_0.05, MD_MW03_2.0, MK_SB75_0.05	27-NOV-2013	05-DEC-2013	11-DEC-2013	✓	05-DEC-2013	14-JAN-2014	✓
<b>EP080: BTEXN</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b>								
TRIP SPIKE,	TSC	20-NOV-2013	03-DEC-2013	04-DEC-2013	✓	04-DEC-2013	04-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b>								
ML_SB34_0.05, ML_SB31_0.1, MK_SB66_0.05, MK_SB45_0.05, MK_SB63_0.03, MD_MW03_3.8, MK_SB69_0.05	ML_SB22_0.05, ML_SB29_0.1, MK_SB67_0.05, MK_SB64_0.05, MD_MW03_2.0, MK_SB75_0.05, TRIP BLANK	27-NOV-2013	03-DEC-2013	11-DEC-2013	✓	04-DEC-2013	11-DEC-2013	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
<b>Soil Glass Jar - Unpreserved (EP080)</b>								
TRIP SPIKE,	TSC	20-NOV-2013	03-DEC-2013	04-DEC-2013	✓	04-DEC-2013	04-DEC-2013	✓
<b>Soil Glass Jar - Unpreserved (EP080)</b>								
ML_SB34_0.05, ML_SB31_0.1, MK_SB66_0.05, MK_SB45_0.05, MK_SB63_0.03, MD_MW03_3.8, MK_SB69_0.05	ML_SB22_0.05, ML_SB29_0.1, MK_SB67_0.05, MK_SB64_0.05, MD_MW03_2.0, MK_SB75_0.05, TRIP BLANK	27-NOV-2013	03-DEC-2013	11-DEC-2013	✓	04-DEC-2013	11-DEC-2013	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Moisture Content	EA055-103	2	20	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	19	10.5	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	4	34	11.8	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	4	37	10.8	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	20	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	20	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	2	50.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	19	5.3	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	34	5.9	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	37	5.4	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	2	50.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	19	5.3	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	34	5.9	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	37	5.4	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	2	50.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	19	5.3	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	34	5.9	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	37	5.4	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	2	50.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement





## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Asbestos Identification in bulk solids	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (2013) Schedule B(3) (Method 506.1)
Volatile Organic Compounds	EP074	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.



## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Matrix Spike (MS) Recoveries</b>							
EG005T: Total Metals by ICP-AES	ES1325412-003	Anonymous	Lead	7439-92-1	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG005T: Total Metals by ICP-AES	ES1325412-003	Anonymous	Zinc	7440-66-6	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.

#### Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- No Analysis Holding Time Outliers exist.

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

**Work Order** : ES1325970  
**Amendment** : 1

**Client** : ENVIRO RESOURCES MANAGEMENT  
**Contact** : MR JONATHAN LEKAWSKI  
**Address** : GROUND FLOOR  
33 SAUNDERS STREET, PYRMONT  
NSW 2009  
LOCKED BAG 24  
BROADWAY NSW, AUSTRALIA 2007

**Laboratory** : Environmental Division Sydney  
**Contact** : Barbara Hanna  
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**E-mail** : Barbara.Hanna@alsglobal.com  
**Telephone** : +61 2 8784 8555  
**Facsimile** : +61 2 8784 8555

**Project** : PROJECT SYMPHONY  
**Order number** : 0207423  
**C-O-C number** : ----  
**Site** : ----  
**Sampler** : T.SHAW

**Page** : 1 of 3  
**Quote number** : ES2013ENVRES0370 (SY/278/13 V3)  
**QC Level** : NEPM 2013 Schedule B(3) and ALS QCS3 requirement

### Dates

**Date Samples Received** : 29-NOV-2013  
**Client Requested Due Date** : 06-DEC-2013  
**Issue Date** : 06-JAN-2014 11:04  
**Scheduled Reporting Date** : **06-DEC-2013**

### Delivery Details

**Mode of Delivery** : Carrier  
**No. of coolers/boxes** : 1 HARD  
**Security Seal** : Intact.  
**Temperature** : 15.9'C - Ice bricks present  
**No. of samples received** : 16  
**No. of samples analysed** : 16

### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Asbestos analysis will be conducted by ALS Newcastle.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EA200 Asbestos Identification in Soils	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP074 (solids) Volatile Organic Compounds	SOIL - S-18 (NO MOIST) TRH(C6-C9)/BTEXN with No Moisture for TBs	SOIL - S-27 TRH/BTEXN/PAH/Phenols/8Metals
ES1325970-001	27-NOV-2013 15:00	ML_SB34_0.05	✓	✓			✓
ES1325970-002	27-NOV-2013 15:00	ML_SB22_0.05	✓	✓			✓
ES1325970-003	27-NOV-2013 15:00	ML_SB31_0.1	✓	✓			✓
ES1325970-004	27-NOV-2013 15:00	ML_SB29_0.1	✓	✓			✓
ES1325970-005	27-NOV-2013 15:00	MK_SB66_0.05	✓	✓			✓
ES1325970-006	27-NOV-2013 15:00	MK_SB67_0.05	✓	✓			✓
ES1325970-007	27-NOV-2013 15:00	MK_SB45_0.05	✓	✓			✓
ES1325970-008	27-NOV-2013 15:00	MK_SB64_0.05	✓	✓			✓
ES1325970-009	27-NOV-2013 15:00	MK_SB63_0.03	✓	✓			✓
ES1325970-010	27-NOV-2013 15:00	MD_MW03_2.0		✓	✓		✓
ES1325970-011	27-NOV-2013 15:00	MD_MW03_3.8		✓	✓		✓
ES1325970-012	27-NOV-2013 15:00	MK_SB75_0.05	✓	✓			✓
ES1325970-013	27-NOV-2013 15:00	MK_SB69_0.05	✓	✓			✓
ES1325970-014	27-NOV-2013 15:00	TRIP BLANK				✓	
ES1325970-015	20-NOV-2013 15:00	TRIP SPIKE				✓	
ES1325970-016	20-NOV-2013 15:00	TSC				✓	

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
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Email jonathan.lekawski@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email symphony.deltawest@erm.com  
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Email symphony.deltawest@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com



## CERTIFICATE OF ANALYSIS

Work Order	: <b>ES1326246</b>	Page	: 1 of 7
Client	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: PROJECT SYMPHONY - MP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 0207423		
C-O-C number	: ----	Date Samples Received	: 03-DEC-2013
Sampler	: TS	Issue Date	: 12-DEC-2013
Site	: ----		
Quote number	: SY/278/13 V3	No. of samples received	: 3
		No. of samples analysed	: 2

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EA200 Legend**
- **EA200 'Am' Amosite (brown asbestos)**
- **EA200 'Ch' Chrysotile (white asbestos)**
- **EA200 'Cr' Crocidolite (blue asbestos)**
- **EA200 'Trace' - Asbestos fibres detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres**
- **EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.**
- **EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.**
- **EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.**
- **Sample ES1326246 # 001 has been reported on an "as received basis"(moisture correction has not been applied).**



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

## Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Ashesh Patel	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Hamish Murray	Supervisor - Soils	Newcastle - Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Shaun Spooner	Laboratory Technician	Newcastle - Asbestos
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics





## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				ML_MW14_0.1	ML_MW14_0.1-0.2	---	---	---
				28-NOV-2013 15:00	28-NOV-2013 15:00	---	---	---
Compound	CAS Number	LOR	Unit	ES1326246-001	ES1326246-002	---	---	---
<b>EA150: Particle Sizing</b>								
+75µm	---	1	%	---	86	---	---	---
+150µm	---	1	%	---	82	---	---	---
+300µm	---	1	%	---	78	---	---	---
+425µm	---	1	%	---	76	---	---	---
+600µm	---	1	%	---	73	---	---	---
+1180µm	---	1	%	---	66	---	---	---
+2.36mm	---	1	%	---	57	---	---	---
+4.75mm	---	1	%	---	45	---	---	---
+9.5mm	---	1	%	---	33	---	---	---
+19.0mm	---	1	%	---	17	---	---	---
+37.5mm	---	1	%	---	4	---	---	---
+75.0mm	---	1	%	---	<1	---	---	---
<b>EA002 : pH (Soils)</b>								
pH Value	---	0.1	pH Unit	---	5.4	---	---	---
<b>EA150: Soil Classification based on Particle Size</b>								
Fines (<75 µm)	---	1	%	---	14	---	---	---
Sand (>75 µm)	---	1	%	---	29	---	---	---
Gravel (>2mm)	---	1	%	---	57	---	---	---
Cobbles (>6cm)	---	1	%	---	<1	---	---	---
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>								
Asbestos Detected	1332-21-4	0.1	g/kg	No	---	---	---	---
Asbestos Type	1332-21-4	0.1	--	-	---	---	---	---
Sample weight (dry)	---	0.01	g	146	---	---	---	---
APPROVED IDENTIFIER:	---	-	--	S.SPOONER	---	---	---	---
<b>ED008: Exchangeable Cations</b>								
Exchangeable Calcium	---	0.1	meq/100g	---	5.1	---	---	---
Exchangeable Magnesium	---	0.1	meq/100g	---	1.0	---	---	---
Exchangeable Potassium	---	0.1	meq/100g	---	<0.1	---	---	---
Exchangeable Sodium	---	0.1	meq/100g	---	<0.1	---	---	---
Exchangeable Aluminium	---	0.1	meq/100g	---	<0.1	---	---	---
Cation Exchange Capacity	---	0.1	meq/100g	---	6.2	---	---	---
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	---	---	---	---



**Analytical Results**

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

ML_MW14_0.1	ML_MW14_0.1-0.2	---	---	---
28-NOV-2013 15:00	28-NOV-2013 15:00	---	---	---

Client sampling date / time

ES1326246-001	ES1326246-002	---	---	---
---------------	---------------	-----	-----	-----

Compound	CAS Number	LOR	Unit	ES1326246-001	ES1326246-002	---	---	---
<b>EG005T: Total Metals by ICP-AES - Continued</b>								
Arsenic	7440-38-2	5	mg/kg	<5	---	---	---	---
Cadmium	7440-43-9	1	mg/kg	<1	---	---	---	---
Chromium	7440-47-3	2	mg/kg	8	---	---	---	---
Copper	7440-50-8	5	mg/kg	11	---	---	---	---
Lead	7439-92-1	5	mg/kg	10	---	---	---	---
Nickel	7440-02-0	2	mg/kg	18	---	---	---	---
Zinc	7440-66-6	5	mg/kg	38	---	---	---	---

<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	---	---	---	---

<b>EP004: Organic Matter</b>								
Organic Matter	---	0.5	%	---	1.8	---	---	---
Total Organic Carbon	---	0.5	%	---	1.0	---	---	---

<b>EP075(SIM)A: Phenolic Compounds</b>								
Phenol	108-95-2	0.5	mg/kg	<0.5	---	---	---	---
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	---	---	---	---
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	---	---	---	---
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	---	---	---	---
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	---	---	---	---
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	---	---	---	---
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	---	---	---	---
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	---	---	---	---
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	---	---	---	---
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	---	---	---	---
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	---	---	---	---
Pentachlorophenol	87-86-5	2	mg/kg	<2	---	---	---	---

<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	---	---	---	---
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	---	---	---	---
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	---	---	---	---
Fluorene	86-73-7	0.5	mg/kg	<0.5	---	---	---	---
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	---	---	---	---
Anthracene	120-12-7	0.5	mg/kg	<0.5	---	---	---	---
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	---	---	---	---



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				ML_MW14_0.1	ML_MW14_0.1-0.2	---	---	---
				28-NOV-2013 15:00	28-NOV-2013 15:00	---	---	---
Compound	CAS Number	LOR	Unit	ES1326246-001	ES1326246-002	---	---	---
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>								
Pyrene	129-00-0	0.5	mg/kg	<0.5	---	---	---	---
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	---	---	---	---
Chrysene	218-01-9	0.5	mg/kg	<0.5	---	---	---	---
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	---	---	---	---
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	---	---	---	---
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	---	---	---	---
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	---	---	---	---
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	---	---	---	---
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	---	---	---	---
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	---	---	---	---
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	---	---	---	---
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	<b>0.6</b>	---	---	---	---
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	<b>1.2</b>	---	---	---	---
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	10	mg/kg	<10	---	---	---	---
C10 - C14 Fraction	----	50	mg/kg	<50	---	---	---	---
C15 - C28 Fraction	----	100	mg/kg	<100	---	---	---	---
C29 - C36 Fraction	----	100	mg/kg	<100	---	---	---	---
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	---	---	---	---
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	---	---	---	---
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	---	---	---	---
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	---	---	---	---
>C16 - C34 Fraction	----	100	mg/kg	<100	---	---	---	---
>C34 - C40 Fraction	----	100	mg/kg	<100	---	---	---	---
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	---	---	---	---
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	---	---	---	---
<b>EP080: BTEXN</b>								
Benzene	71-43-2	0.2	mg/kg	<0.2	---	---	---	---
Toluene	108-88-3	0.5	mg/kg	<0.5	---	---	---	---
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	---	---	---	---
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	---	---	---	---



## Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)

Client sample ID

				ML_MW14_0.1	ML_MW14_0.1-0.2	---	---	---
				28-NOV-2013 15:00	28-NOV-2013 15:00	---	---	---
Compound	CAS Number	LOR	Unit	ES1326246-001	ES1326246-002	---	---	---
<b>EP080: BTEXN - Continued</b>								
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	---	---	---	---
^ Sum of BTEX	---	0.2	mg/kg	<0.2	---	---	---	---
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	---	---	---	---
Naphthalene	91-20-3	1	mg/kg	<1	---	---	---	---
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>								
Phenol-d6	13127-88-3	0.1	%	97.1	---	---	---	---
2-Chlorophenol-D4	93951-73-6	0.1	%	109	---	---	---	---
2.4.6-Tribromophenol	118-79-6	0.1	%	109	---	---	---	---
<b>EP075(SIM)T: PAH Surrogates</b>								
2-Fluorobiphenyl	321-60-8	0.1	%	105	---	---	---	---
Anthracene-d10	1719-06-8	0.1	%	90.2	---	---	---	---
4-Terphenyl-d14	1718-51-0	0.1	%	92.6	---	---	---	---
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	120	---	---	---	---
Toluene-D8	2037-26-5	0.1	%	110	---	---	---	---
4-Bromofluorobenzene	460-00-4	0.1	%	98.2	---	---	---	---

## Analytical Results

### Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>		
EA200: Description	ML_MW14_0.1 - 28-NOV-2013 15:00	Mid grey - brown clay soil with grey rocks plus a trace of vegetation.



## Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

## QUALITY CONTROL REPORT

Work Order	: <b>ES1326246</b>	Page	: 1 of 10
Client	: <b>ENVIRO RESOURCES MANAGEMENT</b>	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: PROJECT SYMPHONY - MP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 03-DEC-2013
C-O-C number	: ----	Issue Date	: 12-DEC-2013
Sampler	: TS	No. of samples received	: 3
Order number	: 0207423	No. of samples analysed	: 2
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



## General Comments

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Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :  
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
RPD = Relative Percentage Difference  
# = Indicates failed QC



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

## Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Ashesh Patel	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Hamish Murray	Supervisor - Soils	Newcastle - Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Shaun Spooner	Laboratory Technician	Newcastle - Asbestos
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics



## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EA002 : pH (Soils) (QC Lot: 3195126)</b>									
ES1326246-002	ML_MW14_0.1-0.2	EA002: pH Value	----	0.1	pH Unit	5.4	5.3	0.0	0% - 20%
<b>ED008: Exchangeable Cations (QC Lot: 3200403)</b>									
ES1326246-002	ML_MW14_0.1-0.2	ED008: Exchangeable Calcium	----	0.1	meq/100g	5.1	5.7	11.3	0% - 20%
		ED008: Exchangeable Magnesium	----	0.1	meq/100g	1.0	1.1	12.4	0% - 20%
		ED008: Exchangeable Potassium	----	0.1	meq/100g	<0.1	<0.1	0.0	0% - 20%
		ED008: Exchangeable Sodium	----	0.1	meq/100g	<0.1	<0.1	0.0	0% - 20%
		ED008: Exchangeable Aluminium	----	0.1	meq/100g	<0.1	<0.1	0.0	0% - 20%
		ED008: Cation Exchange Capacity	----	0.1	meq/100g	6.2	6.9	11.4	0% - 20%
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3196461)</b>									
ES1326190-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	35	23	40.9	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	5	5	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	10	<5	65.9	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	19	32	49.8	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	21	27	25.3	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	24	45	59.8	No Limit
ES1326192-003	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	16	14	9.4	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	14	13	9.5	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	100	97	3.1	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	9	9	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	99	97	2.1	0% - 50%
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3196462)</b>									
ES1326190-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1326192-003	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EP004: Organic Matter (QC Lot: 3200424)</b>									
ES1325886-005	Anonymous	EP004: Organic Matter	----	0.5	%	0.6	0.6	0.0	No Limit
		EP004: Total Organic Carbon	----	0.5	%	<0.5	<0.5	0.0	No Limit
ES1326321-015	Anonymous	EP004: Organic Matter	----	0.5	%	3.5	4.0	12.4	No Limit
		EP004: Total Organic Carbon	----	0.5	%	2.0	2.3	12.4	No Limit
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3193897)</b>									
ES1326197-021	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit





Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)A: Phenolic Compounds (QC Lot: 3193897) - continued</b>									
ES1326197-021	Anonymous	EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit		
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3193897)</b>									
ES1326197-021	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit		
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3193896)</b>									
ES1326197-021	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3193909)</b>									
ES1326197-021	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3193896)</b>									
ES1326197-021	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit

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 Work Order : ES1326246  
 Client : ENVIRO RESOURCES MANAGEMENT  
 Project : PROJECT SYMPHONY - MP



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3193896) - continued</b>										
ES1326197-021	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3193909)</b>										
ES1326197-021	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit	
<b>EP080: BTEXN (QC Lot: 3193909)</b>										
ES1326197-021	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit		



## Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>ED008: Exchangeable Cations (QCLot: 3200403)</b>									
ED008: Exchangeable Calcium	----	0.1	meq/100g	<0.1	1 meq/100g	99.3	90	128	
ED008: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	1.67 meq/100g	90.5	86	120	
ED008: Exchangeable Potassium	----	0.1	meq/100g	<0.1	0.51 meq/100g	104	85	135	
ED008: Exchangeable Sodium	----	0.1	meq/100g	<0.1	0.87 meq/100g	91.6	86	128	
ED008: Exchangeable Aluminium	----	0.1	meq/100g	<0.1	----	----	----	----	
ED008: Cation Exchange Capacity	----	0.1	meq/100g	<0.1	----	----	----	----	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3196461)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	104	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	95.6	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	112	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	107	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	96.4	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	107	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	80.3	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	98.5	81	133	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3196462)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	84.8	66	112	
<b>EP004: Organic Matter (QCLot: 3200424)</b>									
EP004: Organic Matter	----	0.5	%	<0.5	4.58 %	100	85	105	
EP004: Total Organic Carbon	----	0.5	%	<0.5	2.66 %	100	84	106	
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3193897)</b>									
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	89.6	74	116	
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	93.2	74	116	
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	89.8	72	116	
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	92.7	69	123	
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	83.9	60.3	117	
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	83.7	69	117	
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	85.9	68	112	
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	88.2	73	117	
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	85.0	76.4	114	
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	81.9	57	111	
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	81.3	68.9	112	
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	14.5	3.9	57	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3193897)</b>									



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3193897) - continued</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	94.0	80	124	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	96.9	77	123	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	99.8	79	123	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	98.8	77	123	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	98.7	79	123	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	94.0	79	123	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	97.7	79	123	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	99.0	79	125	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	88.4	73	121	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	93.8	81	123	
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	81.1	70	118	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	84.1	77	123	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	85.1	76	122	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	74.8	71	113	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	83.4	71.7	113	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	83.7	72.4	114	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3193896)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	103	71	131	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	104	74	138	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	103	64	128	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3193909)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	99.2	68.4	128	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3193896)</b>									
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	105	70	130	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	104	74	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	
		50	mg/kg	----	150 mg/kg	89.1	63	131	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3193909)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	98.0	68.4	128	
<b>EP080: BTEXN (QCLot: 3193909)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	87.5	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	85.3	62	128	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	78.5	58	118	
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	84.1	60	120	
	106-42-3								
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	85.9	60	120	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	91.4	62	138	



## Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%) MS	Recovery Limits (%)	
						Low	High
<b>EG005T: Total Metals by ICP-AES (QCLot: 3196461)</b>							
ES1326190-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	94.9	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	98.1	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	73.5	70	130
		EG005T: Copper	7440-50-8	125 mg/kg	116	70	130
		EG005T: Lead	7439-92-1	125 mg/kg	101	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	99.3	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	104	70	130
		EG005T: Zinc	7440-66-6	125 mg/kg	113	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3196462)</b>							
ES1326190-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	101	70	130
<b>EP004: Organic Matter (QCLot: 3200424)</b>							
ES1325886-005	Anonymous	EP004: Organic Matter	----	0.61 %	103	----	----
		EP004: Total Organic Carbon	----	0.35 %	104	----	----
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3193897)</b>							
ES1326197-021	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	88.6	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	92.5	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	83.5	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	83.8	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	55.2	20	130
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3193897)</b>							
ES1326197-021	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	94.6	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	92.4	70	130
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3193896)</b>							
ES1326197-021	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	74.9	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	85.0	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	76.7	52	132
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3193909)</b>							
ES1326197-021	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	104	70	130
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3193896)</b>							
ES1326197-021	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	99.3	73	137
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	82.1	53	131
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	60.3	52	132



Sub-Matrix: SOIL				Matrix Spike (MS) Report				
				Spike Concentration	Spike Recovery(%) MS	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3193909)</b>								
ES1326197-021	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	100	70	130	
<b>EP080: BTEXN (QCLot: 3193909)</b>								
ES1326197-021	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	80.8	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	80.6	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	78.3	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	82.3	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	85.3	70	130	
	EP080: Naphthalene	91-20-3	2.5 mg/kg	88.0	70	130		

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3193896)</b>										
ES1326197-021	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	74.9	----	73	137	----	----
		EP071: C15 - C28 Fraction	----	3140 mg/kg	85.0	----	53	131	----	----
		EP071: C29 - C36 Fraction	----	2860 mg/kg	76.7	----	52	132	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3193896)</b>										
ES1326197-021	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	99.3	----	73	137	----	----
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	82.1	----	53	131	----	----
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	60.3	----	52	132	----	----
<b>EP075(SIM)A: Phenolic Compounds (QCLot: 3193897)</b>										
ES1326197-021	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	88.6	----	70	130	----	----
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	92.5	----	70	130	----	----
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	83.5	----	60	130	----	----
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	83.8	----	70	130	----	----
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	55.2	----	20	130	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3193897)</b>										
ES1326197-021	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	94.6	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	92.4	----	70	130	----	----
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 3193909)</b>										
ES1326197-021	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	104	----	70	130	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3193909)</b>										
ES1326197-021	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	100	----	70	130	----	----



Sub-Matrix: SOIL

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)		
					MS	MSD	Low	High	Value	Control Limit	
<b>EP080: BTEXN (QCLot: 3193909)</b>											
ES1326197-021	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	80.8	----	70	130	----	----	
		EP080: Toluene	108-88-3	2.5 mg/kg	80.6	----	70	130	----	----	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	78.3	----	70	130	----	----	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	82.3	----	70	130	----	----	
			106-42-3								
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	85.3	----	70	130	----	----	
		EP080: Naphthalene	91-20-3	2.5 mg/kg	88.0	----	70	130	----	----	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3196461)</b>											
ES1326190-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	94.9	----	70	130	----	----	
		EG005T: Cadmium	7440-43-9	50 mg/kg	98.1	----	70	130	----	----	
		EG005T: Chromium	7440-47-3	50 mg/kg	73.5	----	70	130	----	----	
		EG005T: Copper	7440-50-8	125 mg/kg	116	----	70	130	----	----	
		EG005T: Lead	7439-92-1	125 mg/kg	101	----	70	130	----	----	
		EG005T: Nickel	7440-02-0	50 mg/kg	99.3	----	70	130	----	----	
		EG005T: Selenium	7782-49-2	50 mg/kg	104	----	70	130	----	----	
		EG005T: Zinc	7440-66-6	125 mg/kg	113	----	70	130	----	----	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3196462)</b>											
ES1326190-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	101	----	70	130	----	----	
<b>EP004: Organic Matter (QCLot: 3200424)</b>											
ES1325886-005	Anonymous	EP004: Organic Matter	----	0.61 %	103	----	----	----	----	----	
		EP004: Total Organic Carbon	----	0.35 %	104	----	----	----	----	----	



## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1326246</b>	Page	: 1 of 7
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: PROJECT SYMPHONY - MP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 03-DEC-2013
C-O-C number	: ----	Issue Date	: 12-DEC-2013
Sampler	: TS	No. of samples received	: 3
Order number	: 0207423	No. of samples analysed	: 2
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers





## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EA002 : pH (Soils)</b>							
Soil Glass Jar - Unpreserved (EA002) ML_MW14_0.1-0.2	28-NOV-2013	05-DEC-2013	05-DEC-2013	✓	05-DEC-2013	05-DEC-2013	✓
<b>EA055: Moisture Content</b>							
Soil Glass Jar - Unpreserved (EA055-103) ML_MW14_0.1	28-NOV-2013	----	----	----	06-DEC-2013	12-DEC-2013	✓
<b>EA150: Particle Sizing</b>							
Snap Lock Bag (EA150) ML_MW14_0.1-0.2	28-NOV-2013	---	27-MAY-2014	----	10-DEC-2013	07-JUN-2014	✓
<b>EA150: Soil Classification based on Particle Size</b>							
Snap Lock Bag (EA150) ML_MW14_0.1-0.2	28-NOV-2013	---	27-MAY-2014	----	10-DEC-2013	07-JUN-2014	✓
<b>EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples</b>							
Snap Lock Bag (EA200) ML_MW14_0.1	28-NOV-2013	---	27-MAY-2014	----	11-DEC-2013	09-JUN-2014	✓
<b>ED008: Exchangeable Cations</b>							
Soil Glass Jar - Unpreserved (ED008) ML_MW14_0.1-0.2	28-NOV-2013	09-DEC-2013	26-DEC-2013	✓	10-DEC-2013	26-DEC-2013	✓
<b>EG005T: Total Metals by ICP-AES</b>							
Soil Glass Jar - Unpreserved (EG005T) ML_MW14_0.1	28-NOV-2013	05-DEC-2013	27-MAY-2014	✓	06-DEC-2013	27-MAY-2014	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>							
Soil Glass Jar - Unpreserved (EG035T) ML_MW14_0.1	28-NOV-2013	05-DEC-2013	26-DEC-2013	✓	06-DEC-2013	26-DEC-2013	✓
<b>EP004: Organic Matter</b>							
Soil Glass Jar - Unpreserved (EP004) ML_MW14_0.1-0.2	28-NOV-2013	09-DEC-2013	26-DEC-2013	✓	09-DEC-2013	26-DEC-2013	✓
<b>EP080/071: Total Petroleum Hydrocarbons</b>							
Soil Glass Jar - Unpreserved (EP071) ML_MW14_0.1	28-NOV-2013	05-DEC-2013	12-DEC-2013	✓	05-DEC-2013	14-JAN-2014	✓
<b>EP075(SIM)A: Phenolic Compounds</b>							
Soil Glass Jar - Unpreserved (EP075(SIM)) ML_MW14_0.1	28-NOV-2013	05-DEC-2013	12-DEC-2013	✓	05-DEC-2013	14-JAN-2014	✓



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>							
Soil Glass Jar - Unpreserved (EP075(SIM)) ML_MW14_0.1	28-NOV-2013	05-DEC-2013	12-DEC-2013	✓	05-DEC-2013	14-JAN-2014	✓
<b>EP080: BTEXN</b>							
Soil Glass Jar - Unpreserved (EP080) ML_MW14_0.1	28-NOV-2013	05-DEC-2013	12-DEC-2013	✓	05-DEC-2013	12-DEC-2013	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013</b>							
Soil Glass Jar - Unpreserved (EP080) ML_MW14_0.1	28-NOV-2013	05-DEC-2013	12-DEC-2013	✓	05-DEC-2013	12-DEC-2013	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Exchangeable Cations with pre-treatment	ED008	1	3	33.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organic Matter	EP004	2	11	18.2	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	10	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
pH (1:5)	EA002	1	10	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	10	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	10	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
Exchangeable Cations with pre-treatment	ED008	1	3	33.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organic Matter	EP004	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	10	10.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	10	10.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	10	10.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
Exchangeable Cations with pre-treatment	ED008	1	3	33.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Organic Matter	EP004	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	10	10.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	10	10.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	10	10.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
Organic Matter	EP004	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	10	10.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	10	10.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	10	10.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH (1:5)	EA002	SOIL	(APHA 21st ed., 4500H+) pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM (2013) Schedule B(3) (Method 103)
Particle Size Analysis (Sieving)	EA150	SOIL	Particle Size Analysis by Sieving according to AS1289.3.6.1 - 2009
Asbestos Identification in bulk solids	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples
Exchangeable Cations with pre-treatment	ED008	SOIL	Rayment & Higginson (1992) Method 15A2. Soluble salts are removed from the sample prior to analysis. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. This method is compliant with NEPM (2013) Schedule B(3) (Method 301)
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Organic Matter	EP004	SOIL	AS1289.4.1.1 - 1997., Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM (2013) Schedule B(3) (Method 105)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (2013) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Exchangeable Cations Preparation Method	ED007PR	SOIL	Rayment & Higginson (1992) method 15A1. A 1M NH <sub>4</sub> Cl extraction by end over end tumbling at a ratio of 1:20. There is no pretreatment for soluble salts. Extracts can be run by ICP for cations.
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of distilled water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)

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Work Order : ES1326246  
Client : ENVIRO RESOURCES MANAGEMENT  
Project : PROJECT SYMPHONY - MP



<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Organic Matter	EP004-PR	SOIL	AS1289.4.1.1 - 1997., Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM (2013) Schedule B(3) (Method 105)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.



## **Summary of Outliers**

### **Outliers : Quality Control Samples**

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### **Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes**

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.
- For all matrices, no Matrix Spike outliers occur.

#### **Regular Sample Surrogates**

- For all regular sample matrices, no surrogate recovery outliers occur.

### **Outliers : Analysis Holding Time Compliance**

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- No Analysis Holding Time Outliers exist.

### **Outliers : Frequency of Quality Control Samples**

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.

## SAMPLE RECEIPT NOTIFICATION (SRN)

### Comprehensive Report

<b>Work Order</b> : <b>ES1326246</b>	
<b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : MR JONATHAN LEKAWSKI <b>Address</b> : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Laboratory</b> : Environmental Division Sydney  <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b> : jonathan.lekawski@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800	<b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555
<b>Project</b> : PROJECT SYMPHONY - MP <b>Order number</b> : 0207423 <b>C-O-C number</b> : ---- <b>Site</b> : ---- <b>Sampler</b> : TS	<b>Page</b> : 1 of 2  <b>Quote number</b> : ES2013ENVRES0370 (SY/278/13 V3)  <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement

#### Dates

<b>Date Samples Received</b> : 03-DEC-2013 <b>Client Requested Due Date</b> : 10-DEC-2013	<b>Issue Date</b> : 04-DEC-2013 13:57 <b>Scheduled Reporting Date</b> : <b>10-DEC-2013</b>
--	---

#### Delivery Details

<b>Mode of Delivery</b> : Carrier <b>No. of coolers/boxes</b> : 1 HARD <b>Security Seal</b> : Intact.	<b>Temperature</b> : 13.6°C - Ice bricks present <b>No. of samples received</b> : 3 <b>No. of samples analysed</b> : 2
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#### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Asbestos and PSD analysis will be conducted by ALS Newcastle.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **All analysis will be reported on the scheduled due date 10/12/13, except for PSD analysis will be reported on 12/12/13.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL	No analysis requested	SOIL - EA002	pH (1:5)	SOIL - EA150*	Particle Size Analysis by Sieving (Default sieves from SOIL - EA200)	Asbestos Identification in Soils	SOIL - ED008	Exchangeable Cations with pre-treatment -All	SOIL - EG005T (solids)	Total Metals by ICP-AES	SOIL - EP004 (Carbon)	Total Organic Carbon (Calc.)	SOIL - S-27	TRHIBTEXNIPAH/Phenols/8Metals
ES1326246-001	28-NOV-2013 15:00	ML_MW14_0.1							✓			✓				✓	
ES1326246-002	28-NOV-2013 15:00	ML_MW14_0.1-0.2			✓		✓				✓				✓		
ES1326246-003	28-NOV-2013 15:00	WASETSOIL_281113	✓														

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com





# CHAIN OF CUSTODY

ALS Laboratory  
please tick →

When using this Chain of Custody form, please ensure that you have completed all the relevant sections before handing the sample to the laboratory. This form is to be used for all samples sent to the laboratory for analysis. It is the responsibility of the client to ensure that the sample is correctly identified and that the Chain of Custody form is correctly completed. The laboratory will not be responsible for any loss or damage to the sample or for any delay in the analysis if the Chain of Custody form is not correctly completed.

When using this Chain of Custody form, please ensure that you have completed all the relevant sections before handing the sample to the laboratory. This form is to be used for all samples sent to the laboratory for analysis. It is the responsibility of the client to ensure that the sample is correctly identified and that the Chain of Custody form is correctly completed. The laboratory will not be responsible for any loss or damage to the sample or for any delay in the analysis if the Chain of Custody form is not correctly completed.

When using this Chain of Custody form, please ensure that you have completed all the relevant sections before handing the sample to the laboratory. This form is to be used for all samples sent to the laboratory for analysis. It is the responsibility of the client to ensure that the sample is correctly identified and that the Chain of Custody form is correctly completed. The laboratory will not be responsible for any loss or damage to the sample or for any delay in the analysis if the Chain of Custody form is not correctly completed.

**CLIENT:** ERM  
**OFFICE:** Sydney  
**PROJECT:** Project Symphony - MP  
**ORDER NUMBER:** 0207423  
**PROJECT MANAGER:** Jonathan Lekawski  
**SAMPLER:** Thavone Shaw/Gavin Powell  
**COC emailed to ALS?** (YES/NO) (NO)  
 Email Reports to (will default to PM if no other addresses are listed): Symphony.DeltaWest@erm.com  
 Email Invoice to (will default to PM if no other addresses are listed): Symphony.DeltaWest@erm.com

**TURNAROUND REQUIREMENTS:**  
 Standard TAT (List due date):  
 Non Standard or urgent TAT (List due date):  
 Ultra Trace Organics: SY278/H3

**ALS QUOTE NO.:** 0435 960 035  
**CONTACT PH:**  
**SAMPLER MOBILE:** 0435 960 035  
**EDD FORMAT (or default):** pdf/csv/edat

**FOR LABORATORY USE ONLY (Circle)**  
 Custody Seal Intact? Yes No N/A  
 Free ice / frozen ice bricks present upon receipt? Yes No N/A  
 Random Sample Temperature on Receipt: °C  
 Other comment:

**RECEIVED BY:** Daniel O'Sullivan  
**DATE/TIME:** 3/12 08:11  
**RELINQUISHED BY:**  
**DATE/TIME:**

**COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:**

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (codes below)	CONTAINER INFORMATION (refer to codes below)	TOTAL CONTAINERS	ANALYSIS REQUIRED Including SUITES (NB. Suite Codes must be listed to extract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Disolved (field filtered bottle required).										Additional Information	
							6-27 (6 metals-As, Cd, Cr, Cu, Ni, Pb, Zn, Hg, TRH/BTEX, PAH/Phenols)	So	Additional Metal -	TRH / BTEX / PAH / Phenol	Asbestos	VOC Scan	PCB	Particle Sizing (hydrometer), TOC -	pH, Exchangeable Carbons plus EC/EC			
1	ML-MW14-0-1	28-11-13	Soil	1 bag, jar	2	2	X	X	X	X	X	X	X	X	X	X		
2	ML-MW14-01-0-2			1 bag	1	1									X	X		
3	waste soil - 28/11/13			1 bag, jar	2	2												HOLD

Environmental Division  
 Sydney  
 Work Order  
**ES1326246**



Telephone : + 61-2-8784 8555

**Water Container Codes:** P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/NaOH Preserved; S = Sodium Hydroxide/NaOH Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airflight Unpreserved Plastic  
 V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airflight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;  
 Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; BT = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>ES1326939</b> <b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : MR JONATHAN LEKAWSKI <b>Address</b> : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007  <b>E-mail</b> : jonathan.lekawski@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800 <b>Project</b> : PROJECT SYMPHONY - MP <b>Order number</b> : 0207423 <b>C-O-C number</b> : ---- <b>Sampler</b> : ---- <b>Site</b> : ----  <b>Quote number</b> : SY/278/13 V3	<b>Page</b> : 1 of 3  <b>Laboratory</b> : Environmental Division Sydney <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164  <b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555 <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement  <b>Date Samples Received</b> : 10-DEC-2013 <b>Issue Date</b> : 17-DEC-2013  <b>No. of samples received</b> : 2 <b>No. of samples analysed</b> : 2
--	---

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

### *Signatories*

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics



---

### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				MI_SB04_2.1	MA_MW07_8.1	---	---	---
				21-NOV-2013 15:00	25-NOV-2013 15:00	---	---	---
Compound	CAS Number	LOR	Unit	ES1326939-001	ES1326939-002	---	---	---
<b>EA055: Moisture Content</b>								
Moisture Content (dried @ 103°C)	---	1.0	%	14.2	16.3	---	---	---
<b>EG005T: Total Metals by ICP-AES</b>								
Selenium	7782-49-2	5	mg/kg	<5	<5	---	---	---
Arsenic	7440-38-2	5	mg/kg	11	<5	---	---	---
Cadmium	7440-43-9	1	mg/kg	<1	<1	---	---	---
Chromium	7440-47-3	2	mg/kg	4	3	---	---	---
Copper	7440-50-8	5	mg/kg	15	28	---	---	---
Lead	7439-92-1	5	mg/kg	34	22	---	---	---
Nickel	7440-02-0	2	mg/kg	7	8	---	---	---
Zinc	7440-66-6	5	mg/kg	29	65	---	---	---
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	---	---	---

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: ES1326939</b>	<b>Page</b>	: 1 of 5
<b>Client</b>	<b>: ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	<b>: MR JONATHAN LEKAWSKI</b>	<b>Contact</b>	: Barbara Hanna
<b>Address</b>	<b>: GROUND FLOOR</b> 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	<b>: jonathan.lekawski@erm.com</b>	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	<b>: +61 02 8584 8888</b>	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	<b>: +61 02 8584 8800</b>	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	<b>: PROJECT SYMPHONY - MP</b>	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b>	<b>: ----</b>	<b>Date Samples Received</b>	: 10-DEC-2013
<b>C-O-C number</b>	<b>: ----</b>	<b>Issue Date</b>	: 17-DEC-2013
<b>Sampler</b>	<b>: ----</b>	<b>No. of samples received</b>	: 2
<b>Order number</b>	<b>: 0207423</b>	<b>No. of samples analysed</b>	: 2
<b>Quote number</b>	<b>: SY/278/13 V3</b>		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

#### Signatories

Celine Conceicao

#### Position

Senior Spectroscopist

#### Accreditation Category

Sydney Inorganics



### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :            Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
                  CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
                  LOR = Limit of reporting  
                  RPD = Relative Percentage Difference  
                  # = Indicates failed QC



### Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EA055: Moisture Content (QC Lot: 3205632)</b>									
ES1326885-016	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	17.0	16.6	2.0	0% - 50%
EW1303554-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	79.5	77.8	2.1	0% - 20%
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3214773)</b>									
ES1326939-001	MI_SB04_2.1	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	4	5	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	7	8	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	11	11	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	15	17	9.8	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	34	28	20.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	29	31	7.4	No Limit
ES1327063-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	12	11	11.5	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	5	4	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	7	6	23.4	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	12	10	14.1	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	76	62	21.2	0% - 50%
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3214774)</b>									
ES1326939-001	MI_SB04_2.1	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.1	0.0	No Limit
ES1327063-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit



### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike	Spike Recovery (%)		
					Concentration	LCS	Low	High
<b>EG005T: Total Metals by ICP-AES (QCLot: 3214773)</b>								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	114	87	129
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	109	80	122
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	108	71	133
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	112	86	128
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	109	81	123
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	117	84	130
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	108	75	131
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	112	81	133
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3214774)</b>								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	85.1	66	112

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
				Concentration	MS	Low	High
<b>EG005T: Total Metals by ICP-AES (QCLot: 3214773)</b>							
ES1326939-001	MI_SB04_2.1	EG005T: Arsenic	7440-38-2	50 mg/kg	108	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	109	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	111	70	130
		EG005T: Copper	7440-50-8	125 mg/kg	109	70	130
		EG005T: Lead	7439-92-1	125 mg/kg	104	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	110	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	109	70	130
		EG005T: Zinc	7440-66-6	125 mg/kg	108	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3214774)</b>							
ES1326939-001	MI_SB04_2.1	EG035T: Mercury	7439-97-6	5 mg/kg	85.6	70	130

### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.





Sub-Matrix: SOIL

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
				Concentration	MS	MSD	Low	High	Value	Control Limit
<b>EG005T: Total Metals by ICP-AES (QCLot: 3214773)</b>										
ES1326939-001	MI_SB04_2.1	EG005T: Arsenic	7440-38-2	50 mg/kg	108	----	70	130	----	----
		EG005T: Cadmium	7440-43-9	50 mg/kg	109	----	70	130	----	----
		EG005T: Chromium	7440-47-3	50 mg/kg	111	----	70	130	----	----
		EG005T: Copper	7440-50-8	125 mg/kg	109	----	70	130	----	----
		EG005T: Lead	7439-92-1	125 mg/kg	104	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	110	----	70	130	----	----
		EG005T: Selenium	7782-49-2	50 mg/kg	109	----	70	130	----	----
		EG005T: Zinc	7440-66-6	125 mg/kg	108	----	70	130	----	----
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3214774)</b>										
ES1326939-001	MI_SB04_2.1	EG035T: Mercury	7439-97-6	5 mg/kg	85.6	----	70	130	----	----

## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1326939</b>	Page	: 1 of 5
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: PROJECT SYMPHONY - MP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 10-DEC-2013
C-O-C number	: ----	Issue Date	: 17-DEC-2013
Sampler	: ----	No. of samples received	: 2
Order number	: 0207423	No. of samples analysed	: 2
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: SOIL

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EA055: Moisture Content</b>							
Soil Glass Jar - Unpreserved (EA055-103) MI_SB04_2.1	21-NOV-2013	----	----	----	11-DEC-2013	05-DEC-2013	*
Soil Glass Jar - Unpreserved (EA055-103) MA_MW07_8.1	25-NOV-2013	----	----	----	11-DEC-2013	09-DEC-2013	*
<b>EG005T: Total Metals by ICP-AES</b>							
Soil Glass Jar - Unpreserved (EG005T) MI_SB04_2.1	21-NOV-2013	16-DEC-2013	20-MAY-2014	✓	17-DEC-2013	20-MAY-2014	✓
Soil Glass Jar - Unpreserved (EG005T) MA_MW07_8.1	25-NOV-2013	16-DEC-2013	24-MAY-2014	✓	17-DEC-2013	24-MAY-2014	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>							
Soil Glass Jar - Unpreserved (EG035T) MI_SB04_2.1	21-NOV-2013	16-DEC-2013	19-DEC-2013	✓	17-DEC-2013	19-DEC-2013	✓
Soil Glass Jar - Unpreserved (EG035T) MA_MW07_8.1	25-NOV-2013	16-DEC-2013	23-DEC-2013	✓	17-DEC-2013	23-DEC-2013	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Moisture Content	EA055-103	2	18	11.1	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	20	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	20	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
Total Mercury by FIMS	EG035T	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
Total Mercury by FIMS	EG035T	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
Total Mercury by FIMS	EG035T	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)



## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.
- For all matrices, no Matrix Spike outliers occur.

#### Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

Matrix: SOIL

Method	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
<b>EA055: Moisture Content</b>						
Soil Glass Jar - Unpreserved MI_SB04_2.1	----	----	----	11-DEC-2013	05-DEC-2013	6
Soil Glass Jar - Unpreserved MA_MW07_8.1	----	----	----	11-DEC-2013	09-DEC-2013	2

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.

**SAMPLE RECEIPT NOTIFICATION (SRN)****Comprehensive Report**

**Work Order** : **ES1326939**

**Client** : **ENVIRO RESOURCES MANAGEMENT**      **Laboratory** : Environmental Division Sydney

**Contact** : MR JONATHAN LEKAWSKI      **Contact** : Barbara Hanna  
**Address** : GROUND FLOOR      **Address** : 277-289 Woodpark Road Smithfield  
33 SAUNDERS STREET, PYRMONT      NSW Australia 2164  
NSW 2009  
LOCKED BAG 24  
BROADWAY NSW, AUSTRALIA 2007

**E-mail** : jonathan.lekawski@erm.com      **E-mail** : Barbara.Hanna@alsglobal.com  
**Telephone** : +61 02 8584 8888      **Telephone** : +61 2 8784 8555  
**Facsimile** : +61 02 8584 8800      **Facsimile** : +61 2 8784 8555

**Project** : PROJECT SYMPHONY - MP      **Page** : 1 of 2

**Order number** : 0207423

**C-O-C number** : ----      **Quote number** : ES2013ENVRES0370 (SY/278/13 V3)

**Site** : ----

**Sampler** : ----      **QC Level** : NEPM 2013 Schedule B(3) and ALS QCS3 requirement

**Dates**

**Date Samples Received** : 10-DEC-2013      **Issue Date** : 10-DEC-2013 19:48  
**Client Requested Due Date** : 18-DEC-2013      **Scheduled Reporting Date** : **18-DEC-2013**

**Delivery Details**

**Mode of Delivery** : Samples on hand      **Temperature** : 4.1°C  
**No. of coolers/boxes** : ----      **No. of samples received** : 2  
**Security Seal** : Intact.      **No. of samples analysed** : 2

**General Comments**

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **This is a rebatch of ES1325783.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - S-02 8 Metals (incl. Digestion)
ES1326939-001	21-NOV-2013 15:00	MI_SB04_2.1	✓	✓
ES1326939-002	25-NOV-2013 15:00	MA_MW07_8.1	✓	✓

## Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: **SOIL**

Evaluation: ✘ = Holding time breach ; ✔ = Within holding time.

Method		Due for extraction	Due for analysis	Samples Received		Instructions Received	
Client Sample ID(s)	Container			Date	Evaluation	Date	Evaluation
<b>EA055-103: Moisture Content</b>							
MA_MW07_8.1	Soil Glass Jar - Unpreserved	----	09-DEC-2013	10-DEC-2013	✘	----	----
MI_SB04_2.1	Soil Glass Jar - Unpreserved	----	05-DEC-2013	10-DEC-2013	✘	----	----

## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com  
Email jonathan.lekawski@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA )
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI )
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC )
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN )
- A4 - AU Tax Invoice ( INV )
- Chain of Custody (CoC) ( COC )
- EDI Format - ENMRG ( ENMRG )
- EDI Format - ESDAT ( ESDAT )
- EDI Format - XTab ( XTAB )

Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com  
Email symphony.deltawest@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV )

Email au.accounts@erm.com



5200-201  
#10-21

Fadi Soro  
10/12/13  
4:00pm

**Fadi Soro**

**From:** Barbara Hanna  
**Sent:** Tuesday, 10 December 2013 3:38 PM  
**To:** Fadi Soro  
**Cc:** Wael Saleh  
**Subject:** FW: ES1325783

Hi Fadi,  
Could you please arrange this rebatch ASAP.

Thanks!!

Kind Regards

**Barbara Hanna**

Client Services Manager  
ALS | Environmental Division  
277-289 Woodpark Road  
Smithfield NSW 2164 Australia

Environmental Division  
Sydney  
Work Order  
**ES1326939**



Telephone : +61-2-8784 8555

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*EnviroMail 69 - Testing Requirements of the new NEPM - July 2013*

*EnviroMail 70 - Variation of Naphthalene by SVOC and VOC Methods in Water - July 2013*

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Reduction in Sample Volumes – Improving quality, safety, efficiency and sustainability in environmental practices



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**From:** Jonathan Lekawski [mailto:Jonathan.Lekawski@erm.com]  
**Sent:** Tuesday, 10 December 2013 2:00 PM  
**To:** Barbara Hanna  
**Cc:** Anne Ashworth; Thavone Shaw  
**Subject:** RE: ES1325783

Yes, please. Thank you.

Cheers,  
Jonathan

---

**From:** Barbara Hanna [mailto:Barbara.Hanna@alsglobal.com]  
**Sent:** Tuesday, December 10, 2013 12:50 PM  
**To:** Jonathan Lekawski  
**Cc:** Anne Ashworth; Thavone Shaw  
**Subject:** RE: ES1325783

Hi Jonathan,

You are correct the only analysis within holding time is the metals. Would you like us to analyse these two samples for metals only?

Kind Regards

**Barbara Hanna**

Client Services Manager  
ALS | Environmental Division

277-289 Woodpark Road

Smithfield NSW 2164 Australia

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Reduction in Sample Volumes - Improving quality, safety, efficiency and sustainability in environmental practices



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---

**From:** Jonathan Lekawski [mailto:Jonathan.Lekawski@erm.com]  
**Sent:** Tuesday, 10 December 2013 12:40 PM  
**To:** Barbara Hanna  
**Cc:** Anne Ashworth; Thavone Shaw  
**Subject:** ES1325783

Hi Barbara –

We've recently picked up the note about a missing sample and a couple extra samples on this work order.

Would you please run the two extra samples (MI\_SB04\_2.1 and MA\_MW07\_8.1) for whatever you're still able to do that was requested for sample MI\_SB04\_1.6. I'm guessing it's probably just the metals given holding times, but please confirm.

Thank you,

Jonathan



**Jonathan Lekawski**  
Principal Consultant | CSM Team Leader  
Environmental Resources Management  
Building C, 33 Saunders Street  
Pymont, NSW 2009

Switch: +61 2 8584 8888 | Direct : +61 2 8584 8830 | Mobile: +61 401 561 734

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## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>ES1402022</b> <b>Client</b> : <b>ENVIRO RESOURCES MANAGEMENT</b> <b>Contact</b> : MR JONATHAN LEKAWSKI <b>Address</b> : GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007  <b>E-mail</b> : jonathan.lekawski@erm.com <b>Telephone</b> : +61 02 8584 8888 <b>Facsimile</b> : +61 02 8584 8800 <b>Project</b> : 0207423 SYMPHONY <b>Order number</b> : ---- <b>C-O-C number</b> : 11734 <b>Sampler</b> : G.P <b>Site</b> : ----  <b>Quote number</b> : SY/278/13 V3	<b>Page</b> : 1 of 3  <b>Laboratory</b> : Environmental Division Sydney <b>Contact</b> : Barbara Hanna <b>Address</b> : 277-289 Woodpark Road Smithfield NSW Australia 2164  <b>E-mail</b> : Barbara.Hanna@alsglobal.com <b>Telephone</b> : +61 2 8784 8555 <b>Facsimile</b> : +61 2 8784 8555 <b>QC Level</b> : NEPM 2013 Schedule B(3) and ALS QCS3 requirement  <b>Date Samples Received</b> : 31-JAN-2014 <b>Issue Date</b> : 07-FEB-2014  <b>No. of samples received</b> : 2 <b>No. of samples analysed</b> : 2
--	---

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

Accredited for compliance with  
ISO/IEC 17025.

### *Signatories*

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Shobhna Chandra	Metals Coordinator	Sydney Inorganics



### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
^ = This result is computed from individual analyte detections at or above the level of reporting



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

<b>MG_SB03_0.2</b>	<b>MG_SB02_0.1</b>	----	----	----
--------------------	--------------------	------	------	------

Client sampling date / time

13-NOV-2013 15:00	13-NOV-2013 15:00	----	----	----
-------------------	-------------------	------	------	------

Compound	CAS Number	LOR	Unit	<b>ES1402022-001</b>	<b>ES1402022-002</b>	----	----	----
----------	------------	-----	------	----------------------	----------------------	------	------	------

### EA055: Moisture Content

<b>Moisture Content (dried @ 103°C)</b>	----	1.0	%	<b>12.1</b>	<b>14.3</b>	----	----	----
---	------	-----	---	-------------	-------------	------	------	------

### EG005T: Total Metals by ICP-AES

<b>Selenium</b>	7782-49-2	5	mg/kg	<5	<5	----	----	----
<b>Arsenic</b>	7440-38-2	5	mg/kg	<b>6</b>	<b>15</b>	----	----	----
<b>Cadmium</b>	7440-43-9	1	mg/kg	<1	<1	----	----	----
<b>Chromium</b>	7440-47-3	2	mg/kg	<b>8</b>	<b>24</b>	----	----	----
<b>Copper</b>	7440-50-8	5	mg/kg	<b>20</b>	<b>12</b>	----	----	----
<b>Lead</b>	7439-92-1	5	mg/kg	<b>25</b>	<b>24</b>	----	----	----
<b>Nickel</b>	7440-02-0	2	mg/kg	<b>23</b>	<b>35</b>	----	----	----
<b>Zinc</b>	7440-66-6	5	mg/kg	<b>52</b>	<b>66</b>	----	----	----

### EG035T: Total Recoverable Mercury by FIMS

<b>Mercury</b>	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	----	----
----------------	-----------	-----	-------	------	------	------	------	------

## QUALITY CONTROL REPORT

<b>Work Order</b>	: <b>ES1402022</b>	Page	: 1 of 5
<b>Client</b>	: <b>ENVIRO RESOURCES MANAGEMENT</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: MR JONATHAN LEKAWSKI	<b>Contact</b>	: Barbara Hanna
<b>Address</b>	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: jonathan.lekawski@erm.com	<b>E-mail</b>	: Barbara.Hanna@alsglobal.com
<b>Telephone</b>	: +61 02 8584 8888	<b>Telephone</b>	: +61 2 8784 8555
<b>Facsimile</b>	: +61 02 8584 8800	<b>Facsimile</b>	: +61 2 8784 8555
<b>Project</b>	: 0207423 SYMPHONY	<b>QC Level</b>	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Site</b>	: ----	<b>Date Samples Received</b>	: 31-JAN-2014
<b>C-O-C number</b>	: 11734	<b>Issue Date</b>	: 07-FEB-2014
<b>Sampler</b>	: G.P	<b>No. of samples received</b>	: 2
<b>Order number</b>	: ----	<b>No. of samples analysed</b>	: 2
<b>Quote number</b>	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



NATA Accredited  
Laboratory 825

Accredited for  
compliance with  
ISO/IEC 17025.

### *Signatories*

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

#### *Signatories*

Celine Conceicao  
Shobhna Chandra

#### *Position*

Senior Spectroscopist  
Metals Coordinator

#### *Accreditation Category*

Sydney Inorganics  
Sydney Inorganics





### **General Comments**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :  
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
RPD = Relative Percentage Difference  
# = Indicates failed QC



### Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EA055: Moisture Content (QC Lot: 3278216)</b>									
ES1402022-002	MG_SB02_0.1	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	14.3	15.3	6.5	0% - 50%
ES1402026-010	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	25.9	27.2	4.6	0% - 20%
<b>EG005T: Total Metals by ICP-AES (QC Lot: 3280264)</b>									
ES1402022-001	MG_SB03_0.2	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	8	9	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	23	27	15.6	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	6	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	20	20	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	25	24	4.2	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	52	56	8.2	0% - 50%
ES1402026-006	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	9	10	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	25	24	5.8	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	3	2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	22	21	6.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	144	134	6.8	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	310	276	11.7	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	123	136	9.9	0% - 20%
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3280263)</b>									
ES1401797-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.1	0.1	0.0	No Limit
ES1401955-004	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3280265)</b>									
ES1402022-001	MG_SB03_0.2	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1402026-006	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	1.4	1.3	11.0	0% - 50%



### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EG005T: Total Metals by ICP-AES (QCLot: 3280264)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	117	87	129	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	107	80	122	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	97.8	71	133	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	106	86	128	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	108	81	123	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	110	84	130	
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	112	75	131	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	114	81	133	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3280263)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	81.8	66	112	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3280265)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	79.9	66	112	

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%) MS	Recovery Limits (%)	
						Low	High
<b>EG005T: Total Metals by ICP-AES (QCLot: 3280264)</b>							
ES1402022-001	MG_SB03_0.2	EG005T: Arsenic	7440-38-2	50 mg/kg	112	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	107	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	107	70	130
		EG005T: Copper	7440-50-8	125 mg/kg	106	70	130
		EG005T: Lead	7439-92-1	125 mg/kg	107	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	98.9	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	109	70	130
		EG005T: Zinc	7440-66-6	125 mg/kg	101	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3280263)</b>							
ES1401797-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	83.6	70	130
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3280265)</b>							
ES1402022-001	MG_SB03_0.2	EG035T: Mercury	7439-97-6	5 mg/kg	88.0	70	130



### Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
				Concentration	MS	MSD	Low	High	Value	Control Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3280263)</b>										
ES1401797-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	83.6	----	70	130	----	----
<b>EG005T: Total Metals by ICP-AES (QCLot: 3280264)</b>										
ES1402022-001	MG_SB03_0.2	EG005T: Arsenic	7440-38-2	50 mg/kg	112	----	70	130	----	----
		EG005T: Cadmium	7440-43-9	50 mg/kg	107	----	70	130	----	----
		EG005T: Chromium	7440-47-3	50 mg/kg	107	----	70	130	----	----
		EG005T: Copper	7440-50-8	125 mg/kg	106	----	70	130	----	----
		EG005T: Lead	7439-92-1	125 mg/kg	107	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	98.9	----	70	130	----	----
		EG005T: Selenium	7782-49-2	50 mg/kg	109	----	70	130	----	----
EG005T: Zinc	7440-66-6	125 mg/kg	101	----	70	130	----	----		
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 3280265)</b>										
ES1402022-001	MG_SB03_0.2	EG035T: Mercury	7439-97-6	5 mg/kg	88.0	----	70	130	----	----



## INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: <b>ES1402022</b>	Page	: 1 of 5
Client	: ENVIRO RESOURCES MANAGEMENT	Laboratory	: Environmental Division Sydney
Contact	: MR JONATHAN LEKAWSKI	Contact	: Barbara Hanna
Address	: GROUND FLOOR 33 SAUNDERS STREET, PYRMONT NSW 2009 LOCKED BAG 24 BROADWAY NSW, AUSTRALIA 2007	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jonathan.lekawski@erm.com	E-mail	: Barbara.Hanna@alsglobal.com
Telephone	: +61 02 8584 8888	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 8584 8800	Facsimile	: +61 2 8784 8555
Project	: 0207423 SYMPHONY	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----	Date Samples Received	: 31-JAN-2014
C-O-C number	: 11734	Issue Date	: 07-FEB-2014
Sampler	: G.P	No. of samples received	: 2
Order number	: ----	No. of samples analysed	: 2
Quote number	: SY/278/13 V3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EA055: Moisture Content</b>							
<b>Soil Glass Jar - Unpreserved (EA055-103)</b> MG_SB03_0.2, MG_SB02_0.1	13-NOV-2013	----	----	----	04-FEB-2014	27-NOV-2013	*
<b>EG005T: Total Metals by ICP-AES</b>							
<b>Soil Glass Jar - Unpreserved (EG005T)</b> MG_SB03_0.2, MG_SB02_0.1	13-NOV-2013	05-FEB-2014	12-MAY-2014	✓	06-FEB-2014	12-MAY-2014	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>							
<b>Soil Glass Jar - Unpreserved (EG035T)</b> MG_SB03_0.2, MG_SB02_0.1	13-NOV-2013	05-FEB-2014	11-DEC-2013	*	06-FEB-2014	11-DEC-2013	*



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Moisture Content	EA055-103	2	20	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	4	35	11.4	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	20	10.0	10.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Laboratory Control Samples (LCS)</b>							
Total Mercury by FIMS	EG035T	2	35	5.7	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Method Blanks (MB)</b>							
Total Mercury by FIMS	EG035T	2	35	5.7	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
<b>Matrix Spikes (MS)</b>							
Total Mercury by FIMS	EG035T	2	35	5.7	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

<i>Analytical Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> )(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)





## Summary of Outliers

### Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

#### Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.
- For all matrices, no Matrix Spike outliers occur.

#### Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

### Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

Matrix: SOIL

Method	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
<b>EA055: Moisture Content</b>						
Soil Glass Jar - Unpreserved MG_SB03_0.2, MG_SB02_0.1	----	----	----	04-FEB-2014	27-NOV-2013	69
<b>EG035T: Total Recoverable Mercury by FIMS</b>						
Soil Glass Jar - Unpreserved MG_SB03_0.2, MG_SB02_0.1	05-FEB-2014	11-DEC-2013	56	06-FEB-2014	11-DEC-2013	57

### Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.

**SAMPLE RECEIPT NOTIFICATION (SRN)****Comprehensive Report**

**Work Order** : **ES1402022**

**Client** : **ENVIRO RESOURCES MANAGEMENT**      **Laboratory** : Environmental Division Sydney

**Contact** : MR JONATHAN LEKAWSKI      **Contact** : Barbara Hanna  
**Address** : GROUND FLOOR      **Address** : 277-289 Woodpark Road Smithfield  
33 SAUNDERS STREET, PYRMONT      NSW Australia 2164  
NSW 2009  
LOCKED BAG 24  
BROADWAY NSW, AUSTRALIA 2007

**E-mail** : jonathan.lekawski@erm.com      **E-mail** : Barbara.Hanna@alsglobal.com  
**Telephone** : +61 02 8584 8888      **Telephone** : +61 2 8784 8555  
**Facsimile** : +61 02 8584 8800      **Facsimile** : +61 2 8784 8555

**Project** : 0207423 SYMPHONY      **Page** : 1 of 2

**Order number** : ----

**C-O-C number** : 11734      **Quote number** : ES2013ENVRES0370 (SY/278/13 V3)

**Site** : ----

**Sampler** : G.P      **QC Level** : NEPM 2013 Schedule B(3) and ALS QCS3 requirement

**Dates**

**Date Samples Received** : 31-JAN-2014      **Issue Date** : 03-FEB-2014 12:50  
**Client Requested Due Date** : 10-FEB-2014      **Scheduled Reporting Date** : **10-FEB-2014**

**Delivery Details**

**Mode of Delivery** : Carrier      **Temperature** : 4.2°C  
**No. of coolers/boxes** : 2 JARS (ON-HAND)      **No. of samples received** : 2  
**Security Seal** : N/A      **No. of samples analysed** : 2

**General Comments**

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Breaches in recommended extraction / analysis holding times may occur. Please refer to the 'Proactive Holding Time Report' below for further details. Please contact ALS if further information is required.**
- **This is rebatch of ES1324880**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EA055-103 Moisture Content	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - S-02 & Metals (incl. Digestion)
ES1402022-001	13-NOV-2013 15:00	MG_SB03_0.2	✓	✓	✓
ES1402022-002	13-NOV-2013 15:00	MG_SB02_0.1	✓	✓	✓

## Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: **SOIL**

Evaluation: ✗ = Holding time breach ; ✓ = Within holding time.

Method		Due for extraction	Due for analysis	Samples Received		Instructions Received	
Client Sample ID(s)	Container			Date	Evaluation	Date	Evaluation
<b>EA055-103: Moisture Content</b>							
MG_SB02_0.1	Soil Glass Jar - Unpreserved	----	27-NOV-2013	31-JAN-2014	✗	----	----
MG_SB03_0.2	Soil Glass Jar - Unpreserved	----	27-NOV-2013	31-JAN-2014	✗	----	----
<b>EG035T: Total Mercury by FIMS</b>							
MG_SB02_0.1	Soil Glass Jar - Unpreserved	11-DEC-2013	----	31-JAN-2014	✗	----	----
MG_SB03_0.2	Soil Glass Jar - Unpreserved	11-DEC-2013	----	31-JAN-2014	✗	----	----

## Requested Deliverables

### ALL INVOICES

- A4 - AU Tax Invoice ( INV ) Email au.accounts@erm.com

### MR JONATHAN LEKAWSKI

- \*AU Certificate of Analysis - NATA ( COA ) Email jonathan.lekawski@erm.com
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI ) Email jonathan.lekawski@erm.com
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC ) Email jonathan.lekawski@erm.com
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN ) Email jonathan.lekawski@erm.com
- Chain of Custody (CoC) ( COC ) Email jonathan.lekawski@erm.com
- EDI Format - ENMRG ( ENMRG ) Email jonathan.lekawski@erm.com
- EDI Format - EQUIS V5 ERM ( EQUIS\_V5\_ERM ) Email jonathan.lekawski@erm.com
- EDI Format - ESDAT ( ESDAT ) Email jonathan.lekawski@erm.com
- EDI Format - XTab ( XTAB ) Email jonathan.lekawski@erm.com

### SYMPHONY DELTAWEST

- \*AU Certificate of Analysis - NATA ( COA ) Email symphony.deltawest@erm.com
- \*AU Interpretive QC Report - DEFAULT (Anon QCI Rep) ( QCI ) Email symphony.deltawest@erm.com
- \*AU QC Report - DEFAULT (Anon QC Rep) - NATA ( QC ) Email symphony.deltawest@erm.com
- A4 - AU Sample Receipt Notification - Environmental HT ( SRN ) Email symphony.deltawest@erm.com
- A4 - AU Tax Invoice ( INV ) Email symphony.deltawest@erm.com
- Chain of Custody (CoC) ( COC ) Email symphony.deltawest@erm.com
- EDI Format - ENMRG ( ENMRG ) Email symphony.deltawest@erm.com
- EDI Format - ESDAT ( ESDAT ) Email symphony.deltawest@erm.com
- EDI Format - XTab ( XTAB ) Email symphony.deltawest@erm.com

### THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice ( INV ) Email au.accounts@erm.com

**Fadi Soro**

Fadi 

**From:** Catherine Bondoc  
**Sent:** Friday, 31 January 2014 2:57 PM  
**To:** Fadi Soro  
**Subject:** FW: Possible Re-batch FW: Project Symphony - ES1324880

31/1/14

3:15pm

Hi Fadi,

Can you please rebatch as per email below:

Tray S82-83.

Thanks

Kind Regards

**Catherine Bondoc**

Client Services Officer  
ALS | Environmental Division

277-289 Woodpark Road  
Smithfield NSW 2164 Australia

***How was your customer experience? Please send us your feedback***

***Please see our latest Enviromails:***

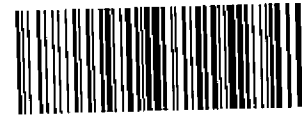
[EnviroMail 68 - Sampling and Analysis Implications of the new NEPM - July 2013](#)

[EnviroMail 69 - Testing Requirements of the new NEPM - July 2013](#)

[EnviroMail 70 - Variation of Naphthalene by SVOC and VOC Methods in Water - July 2013](#)

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**From:** Thavone Shaw [mailto:Thavone.Shaw@erm.com]

**Sent:** Friday, 31 January 2014 2:55 PM

**To:** Catherine Bondoc; ALSEnviro Sydney

**Subject:** RE: Possible Re-batch FW: Project Symphony - ES1324880

Hi Catherine,

①

②

That's great news. Can you please have MG\_SB03\_0.2 and MG\_SB02\_0.1 analysed for:

- arsenic,
- cadmium
- chromium
- copper
- nickel
- lead
- mercury
- selenium
- zinc

9

10

We also have a quote for this job: SY/278/13. A standard TAT is fine.

Thanks so much for your help!

Kind regards,  
Thavone Shaw.

Environmental Resources Management Pty Ltd  
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Pyrmont NSW 2009

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Fax: +61 2 8584 8800  
[www.erm.com](http://www.erm.com)

---

**From:** Catherine Bondoc [mailto:Catherine.Bondoc@alsglobal.com]  
**Sent:** Friday, January 31, 2014 2:42 PM  
**To:** Thavone Shaw; ALSEnviro Sydney  
**Subject:** RE: Possible Re-batch FW: Project Symphony - ES1324880  
**Importance:** High

Hi Thavone,

Great news, we still have those samples. I can have those samples re-batched for you; can you please specify which metals you would?

Kind Regards

**Catherine Bondoc**

Client Services Officer  
ALS | Environmental Division

277-289 Woodpark Road  
Smithfield NSW 2164 Australia

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Annex I

## EIL And UCL Calculations



**General UCL Statistics for Full Data Sets**

**User Selected Options**

From File WorkSheet\_a.wst

Full Precision OFF

Confidence Coefficient 95%

Number of Bootstrap Operations 2000

Copper 1.5 m AEC MK

**General Statistics**

Number of Valid Observations 9      Number of Distinct Observations 9

**Raw Statistics**

**Log-transformed Statistics**

Minimum	5	Minimum of Log Data	1.609
Maximum	204	Maximum of Log Data	5.318
Mean	40.33	Mean of log Data	3.096
Median	21	SD of log Data	1.037
SD	62.37		
Coefficient of Variation	1.546		
Skewness	2.825		

**Warning: There are only 9 Values in this data**

**Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions**

[The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.](#)

**Relevant UCL Statistics**

**Normal Distribution Test**

**Lognormal Distribution Test**

Shapiro Wilk Test Statistic	0.554	Shapiro Wilk Test Statistic	0.927
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829

**Data not Normal at 5% Significance Level**

**Data appear Lognormal at 5% Significance Level**

**Assuming Normal Distribution**

**Assuming Lognormal Distribution**

95% Student's-t UCL	78.99	95% H-UCL	128
<b>95% UCLs (Adjusted for Skewness)</b>		95% Chebyshev (MVUE) UCL	89.49
95% Adjusted-CLT UCL (Chen-1995)	95.44	97.5% Chebyshev (MVUE) UCL	113.1
95% Modified-t UCL (Johnson-1978)	82.25	99% Chebyshev (MVUE) UCL	159.5

**Gamma Distribution Test**

**Data Distribution**

k star (bias corrected)	0.717	<b>Data Follow Appr. Gamma Distribution at 5% Significance Level</b>
Theta Star	56.27	
MLE of Mean	40.33	
MLE of Standard Deviation	47.64	
nu star	12.9	

**Approximate Chi Square Value (.05)**

**Nonparametric Statistics**

Adjusted Level of Significance	0.0231	95% CLT UCL	74.53
Adjusted Chi Square Value	4.862	95% Jackknife UCL	78.99
		95% Standard Bootstrap UCL	71.64
Anderson-Darling Test Statistic	0.823	95% Bootstrap-t UCL	246.9
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	247.3



Inputs	
Select contaminant from list below	Cr_III
Below needed to calculate fresh and aged ACLs	
Enter % clay (values from 0 to 100%)	21.75
Below needed to calculate fresh and aged ABCs	
Measured background concentration (mg/kg). Leave blank if no measured value	
or for fresh ABCs only	
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration	7
or for aged ABCs only	
Enter State (or closest State)	NSW
Enter traffic volume (high or low)	low

Outputs		
Land use	Cr III soil-specific EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	140	170
Urban residential and open public spaces	280	520
Commercial and industrial	420	870

<b>Inputs</b>	
Select contaminant from list below	
Cu	
Below needed to calculate fresh and aged ACLs	
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)	
5.9	
Enter soil pH (calcium chloride method) (values from 1 to 14)	
4.8	
Enter organic carbon content (%OC) (values from 0 to 50%)	
1.2	
Below needed to calculate fresh and aged ABCs	
Measured background concentration (mg/kg). Leave blank if no measured value	
24	
or for fresh ABCs only	
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration	
7	
or for aged ABCs only	
Enter State (or closest State)	
NSW	
Enter traffic volume (high or low)	
low	

<b>Outputs</b>		
Land use	Cu soil-specific EILs	
	(mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	40	50
Urban residential and open public spaces	65	100
Commercial and industrial	80	130

Inputs	
Select contaminant from list below	
Ni	
Below needed to calculate fresh and aged ACLs	
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)	
5.9	
Below needed to calculate fresh and aged ABCs	
Measured background concentration (mg/kg). Leave blank if no measured value	
77	
or for fresh ABCs only	
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration	
7	
or for aged ABCs only	
Enter State (or closest State)	
NSW	
Enter traffic volume (high or low)	
low	

Outputs		
Land use	Ni soil-specific EILs	
	(mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	80	85
Urban residential and open public spaces	90	120
Commercial and industrial	110	160

Inputs	
Select contaminant from list below	
Zn	
Below needed to calculate fresh and aged ACLs	
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)	
5.9	
Enter soil pH (calcium chloride method) (values from 1 to 14)	
4.8	
Below needed to calculate fresh and aged ABCs	
Measured background concentration (mg/kg). Leave blank if no measured value	
or for fresh ABCs only	
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration	
7	
or for aged ABCs only	
Enter State (or closest State)	
NSW	
Enter traffic volume (high or low)	
low	

Outputs		
Land use	Zn soil-specific EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	45	110
Urban residential and open public spaces	85	210
Commercial and industrial	110	280

Annex J

## Survey Data



Location	Alternate Name	EASTING	NORTHING	CASING RL	GRND RL
MA_SB01	MA_MW01	222454.755	6304458.476	973.946	973.264
MA_SB07	MA_MW07	222912.408	6304608.314	956.628 / 956.608	956.108
MA_SB12	MA_MW12	223180.343	6304785.839	947.505	946.818
MA_X_5/D11	MA_X_5/D11	223167.75	6304955.144	947.196	946.834
MA_X_MW15	MA_X_MW15	223158.42	6304951.376	947.524	946.872
MA_X_MW16	MA_X_MW16	223256.937	6305424.962	946.861	946.126
MB_SB02	MB_MW02	224276.761	6305734.52	931.370 / 931.330	930.64
MB_SB03	MB_MW03	224228.704	6305502.01	932.942	932.998
MB_SB04	MB_MW04	223958.077	6305366.642	936.068	936.021
MB_SB05	MB_MW05	223711.514	6305632.182	936.029	935.314
MC_SB01	MC_MW01	223535.7	6304800.687	940.057	940.101
MC_SB02	MC_MW02	223655.711	6304777.882	939.916	939.976
MC_SB03	MC_MW03	223748.262	6304746.383	939.931	939.995
MC_SB04	MC_MW04	223839.009	6304812.685	940.233	940.315
MD_SB01	MD_MW01	223691.996	6305167.699	940.252	940.342
MD_SB03	MD_MW03	223767.709	6305159.928	939.937	940.056
MD_SB04	MD_MW04	223836.307	6305157.323	940.105	940.177
ME_X_MW01		224039.736	6305305.227	936.674	936.59
ME_X_MW06		224080.416	6305335.535	936.192	936.199
ME_X_MW03		224077.257	6305324.446	936.246	936.255
ME_SB04	ME_MW04	224054.715	6305279.551	936.569	936.644
ME_X_MW05		224085.543	6305316.425	936.301	936.301
ME_X_MW02		224064.563	6305322.04	936.336	936.282
ME_X_MWMP7	ME_X_MWMP7	224060.141	6305294.343	936.458	936.505
ME_X_MWMP8	ME_X_MWMP8	224074.074	6305315.535	936.098	936.146
MF_SB01	MF_MW01	224249.559	6304731.168	952.094	951.466
MF_SB02	MF_MW02	224272.296	6304731.44	952.537	951.85
MF_SB03	MF_MW03	224274.563	6304653.579	955.123	954.439
MF_SB04	MF_MW04	224257.943	6304808.021	949.889	949.193
MF_SB05	MF_MW05	224291.098	6304810.57	950.365	949.78
MG_X_4/D1	MG_X_4/D1	225604.211	6305354.557	912.931	912.281
MG_X_4/D10	MG_X_4/D10	225241.587	6304897.904	926.096	925.976
MG_X_4/D3	MG_X_4/D3	225168.938	6305718.211	920.062	919.887
MG_X_4/D5	MG_X_4/D5	224727.713	6305772.207	925.778	925.383
MG_X_4/D9	MG_X_4/D9	225686.601	6305313.541	909.707	909.632
MG_X_MP1	MG_X_MP1	224593.556	6305258.452	943.074 / 943.004	942.378
MH_SB01	MH_MW01	225033.028	6304574.317	939.597	938.987
MH_SB02	MH_MW02	224961.537	6304377.109	935.51	935.579
MH_SB03	MH_MW03	225497.112	6304938.047	928.365	928.411
MH_X_D15	MH_X_D15	225027.487	6304669.496	940.836 / 940.806	940.176
MH_X_D18	MH_X_D18	225278.133	6304709.943	932.918 / 932.768	932.177
MI_X_5/D2	MI_X_5/D2	224206.727	6305121.768	943.42	943.233
MI_X_5/D3	MI_X_5/D3	224262.305	6305296.035	942.76	942.34
MI_X_5/D6	MI_X_5/D6	224333.979	6305106.202	947.381	947.044
MI_X_5/D7	MI_X_5/D7	224374.002	6305324.637	941.961	941.356
MI_X_5/D8	MI_X_5/D8	224349.741	6305246.318	947.317	946.952
MJ_X_MWMP1	MJ_X_MWMP1	223705.02	6305134.543	940.024	940.054
MJ_X_MWMP2	MJ_X_MWMP2	223713.857	6305163.283	940.025	940.038
MJ_X_MWMP3	MJ_X_MWMP3	223717.458	6305162.057	939.984	939.997
MJ_X_MWMP4	MJ_X_MWMP4	223881.665	6305092.116	939.941	940.005
MJ_X_MWMP5	MJ_X_MWMP5	223884.595	6305108.976	940.195	940.178

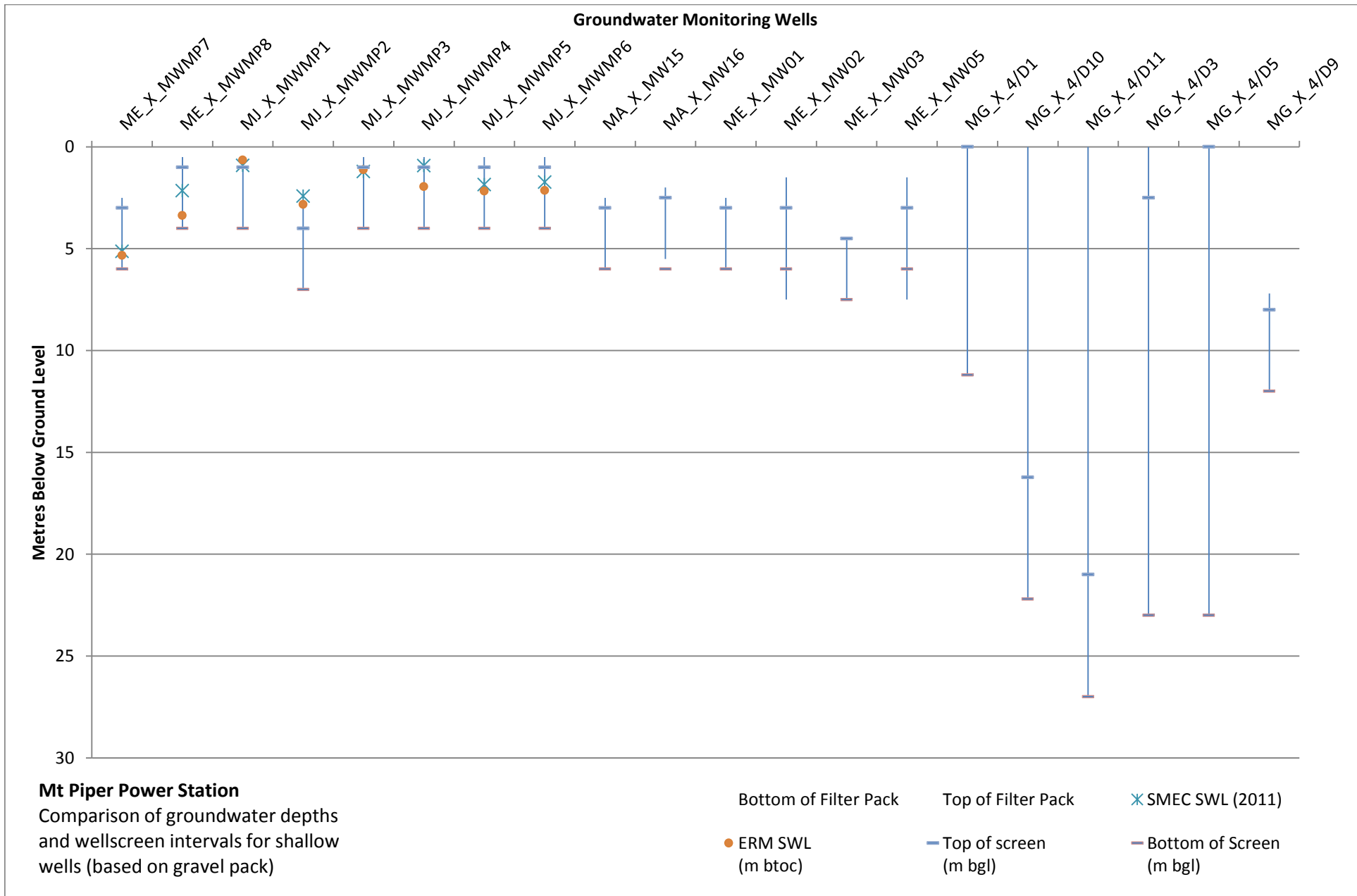


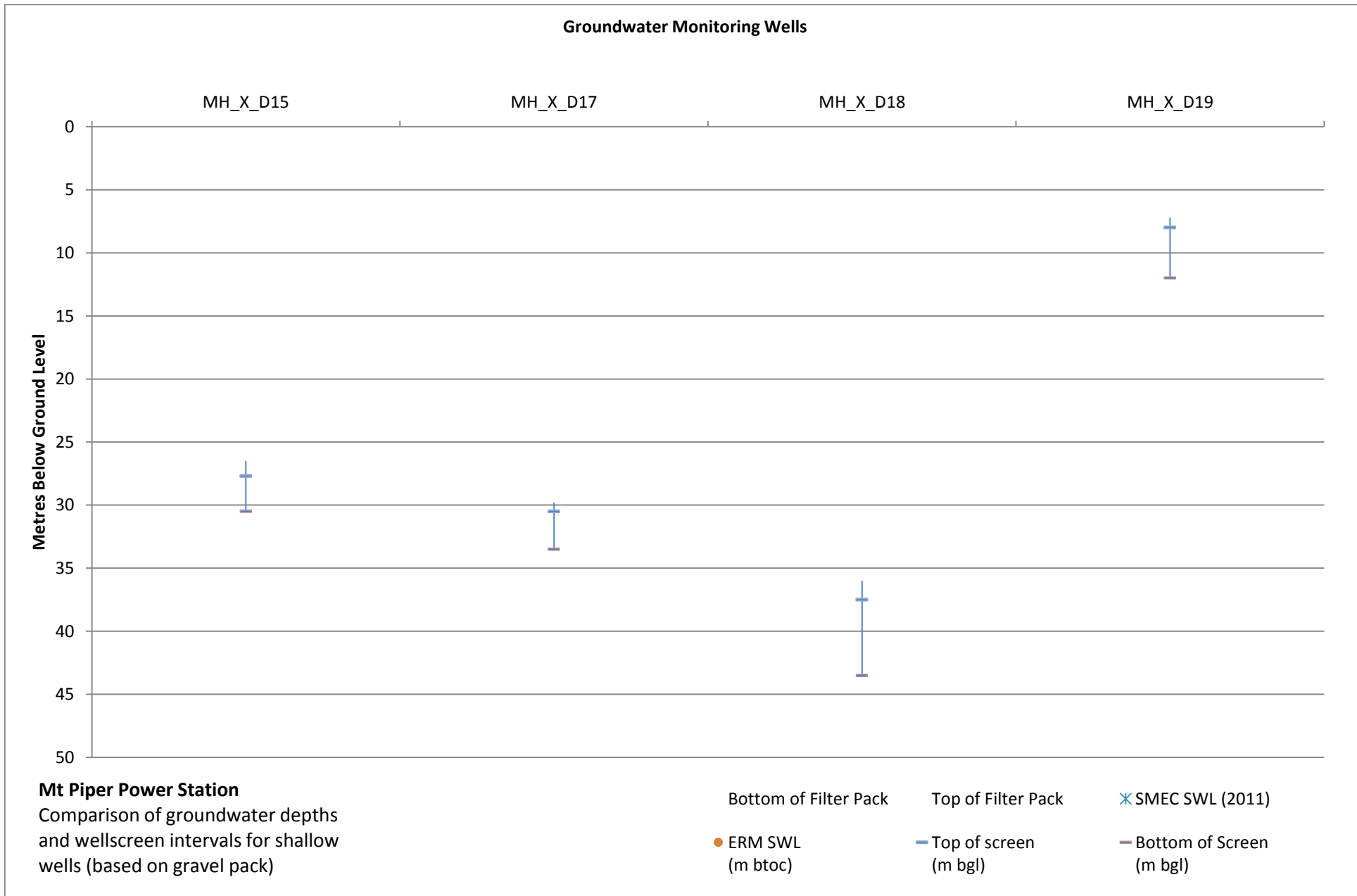


Location	Alternate Name	EASTING	NORTHING	CASING RL	GRND RL
MJ_X_MWMP6	MJ_X_MWMP6	223888.605	6305107.211	940.193	940.224
MK_SB16	MK_MW01	223647.956	6305089.593	940.335	940.399
MK_SB39	MK_MW02	223867.036	6305228.778	939.049	939.085
MK_SB68	MK_MW03	223965.087	6305320.671	937.886	937.955
MK_SB87	MK_MW04	223654.333	6304969.759	940.204	940.266
MK_SB51	MK_MW05	223821.517	6304683.876	941.111	940.501
MK_SB76	MK_MW06	224090.732	6305163.534	938.058	938.077
MK_SB22	MK_MW07	223717.658	6305241.385	940.281	939.452
MK_SB78	MK_MW08	224061.577	6305041.807	940.183	940.202
MK_SB42	MK_MW09	223840.501	6305091.518	940.04	939.93
MK_SB25	MK_MW10	223757.173	6305390.506	938.011	937.363
MK_SB65	MK_MW11	223934.308	6304901.888	940.199	942.836
ML_SB03	ML_MW03	223807.068	6304186.698	966.594	965.919
ML_SB05	ML_MW05	224230.841	6304374.026	972.861	972.023
ML_SB07	ML_MW07	224490.957	6305982.259	920.926 / 920.904	920.218
ML_SB08	ML_MW08	223772.854	6305842.427	935.799	935.109
ML_SB10	ML_MW10	222533.14	6305045.977	975.418	974.752
ML_SB12	ML_MW12	222969.584	6304324.154	955.484	954.714
ML_SB15	ML_MW15	223329.968	6304666.551	950.881	950.161
ML_SB20	ML_MW20	223646.358	6304540.879	960.532	959.742
ML_SB21	ML_MW21	223812.943	6304423.705	962.995	962.315
ME_X_R		224074.448	6305316.776	936.208	936.215
MG_X_4/D4	MG_X_4/D4	224609.724	6305939.264	919.701	919.451

Annex K

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