APPENDIX 7. INVESTIGATIONS – SOIL SAMPLING

17 June 2019

Mr George Kiritsis
Harcourts Williams Luxury
60 Kensington Road
Rose Park SA 5067

Dear George

Re: Medindie Soil Sampling

1. Introduction

Environmental Projects (EP) was commissioned by Harcourts Williams Luxury (HWL) to undertake in-situ soil sampling at 43 Main North Road, Medindie, South Australia (the site). A site location plan is provided as Figure 1, **Attachment 1**.

EP understood:

- the site has an area of approximately 1500 m^2 and is occupied by a large shed structure on the Main North Road frontage. Approximately 500 m^2 at the rear of the site is unsealed
- the site was formerly used for vehicle maintenance and there's a possibility that waste oils and other liquids may have been disposed of on the unsealed portion of the site
- it was unknown if there were any underground storage tanks (USTs) on site
- soil sampling was required as part of initial investigations for offsite waste soil disposal classification and for potential site redevelopment for high density-residential use.

1.1 Objectives

The objective of the soil sampling was to determine the waste disposal classification of in-situ soils.

1.2 Regulatory Guidance

Intrusive assessment of soils at the subject site was completed with reference to the guidance in the following publications:

- Environment Protection Authority SA (2010) Standard for the production and use of Waste Derived Fill, South Australia
- Environment Protection Authority SA (2018) Guidelines for the assessment and remediation of site contamination

- Environment Protection Authority Victoria, 2007. Soils Sampling Guideline (Off-site Management and Acceptance to Landfill). Publication 1178
- National Environmental Protection (Assessment of Site Contamination) Measure (ASC NEPM) 1999 (as amended 2013)
- Standards Australia (AS) 4482.1-2005: Guide to the investigation and sampling of sites with potentially contaminated soil Part 1: Non-volatile and semi-volatile compounds
- Standards Australia, AS 4482.2-1999 Guide to the investigation of potentially contaminated soil Part 2: Volatile substances

2. Methodology

The scope of works and the soil sampling methodology completed is outlined in Table 2-1.

Table 2-1: Soil sampling methodology

Activity	Description
Preparation of Environment, Health and Safety (EHS) Plan	Prior to the commencement of fieldwork, EP prepared and EHS plan to identify known hazards to the health and safety of project personnel and the environment, based on an understanding of the work and EP's experience on similar projects.
Soil sampling	On 28 March 2019, 8 soil bores (SB1-SB8) were drilled using push tube methodology by licensed driller Aussie Probe. Sample locations are provided on Figure 2, **Attachment 1**. Soil samples were collected at depths considered appropriate for sampling by EP to ensure all discrete soil layers were sampled. 35 primary samples were collected.
Sample handling	Samples were handled exclusively by EP personnel and were stored in glass jars provided by the primary contract laboratory, Envirolab. Disposable nitrile gloves were worn whilst handling all samples and were replaced prior to the collection of each sample.
Soil gas screening	A calibrated photo-ionisation detector (PID) was used to screen replicate soil samples for the presence of volatile organic compounds (VOCs). Soil samples were placed into zip-lock plastic bags and allowed to equilibrate under ambient temperatures before PID readings were undertaken. PID readings were recorded on the soil logs and are provided in **Attachment 2**.
Decontamination of sampling equipment	Core trays and push tubes were decontaminated using a phosphate free Decon 90 solution followed by a potable water rinse.
Quality control blanks and duplicate samples	Eight blind coded duplicates were collected whilst sampling. One duplicate (Dup 7, duplicate of SB7-1) was selected for intra-laboratory testing at Envirolab and one duplicate (Dup 6, duplicate of SB6-2) was selected for inter-laboratory testing at secondary laboratory Australia Laboratory Services (ALS). One equipment rinsate sample (EB) was collected and one trip blank sample (TB) was placed in the sample batch accompanying the soil jars from the field to the laboratory. EP's QA/QC methodology was generally consistent with the recommendations in ASC NEPM.
Soil logging	Soils encountered at each location were logged in general accordance with Standards Australia (1993) Geotechnical Site Investigations AS1726. Soil logs are provided as **Attachment 2**.
Sample preservation and transportation	All samples were stored under chilled conditions in a portable cooler immediately after sampling and prior to and during delivery to the laboratory. Sample transport was performed in accordance with EP's COC procedures.
Laboratory analysis	The following laboratory testing was requested:

Activity	Description
	Eight primary samples (and one intra-laboratory duplicate and one inter-laboratory duplicate) were selected for: - heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc) - total recoverable hydrocarbons (TRH) - benzene, toluene, ethylbenzene, xylene and naphthalene (BTEXN) Four primary samples were selected for: - polycyclic aromatic hydrocarbon (PAH) - volatile organic compounds (VOC) One primary sample was selected for a [1]NEPM HIL Screen. Envirolab and ALS were both NATA accredited for the selected testing.
Additional laboratory testing (ASLP and MEP)	On review of the primary laboratory results Toxicity Characteristic Leaching Procedure (TCLP) was completed using Australian Standard Leaching Procedure (ASLP) on metals (arsenic, copper, lead and zinc). Multiple Extraction Procedure (MEP) was selected for sample SB8-2 for benzo(a)pyrene.

[1]NEPM HIL screen – metals (arsenic, beryllium, boron, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, selenium, zinc), hexavalent chromium, cyanide, PAHs, phenol, pentachlorophenol, cresols, DDT+DDE+DDD, aldrin+dieldrin, chlordane, endosulfan, endrin, heptachlor, hexachlorobenzene (HCB), methoxychlor, chlorpyrifos, polychlorinated biphenyl (PCB), mirex, toxaphene, atrazine, bifenthrin

3. Screening Criteria

Soil Disposal

Concentrations are assessed against applicable soil disposal criteria to determine waste classification. The criteria used to assess the suitability of soils for re-use and /or for off-site disposal are documented in the following guidelines:

- Environment Protection Authority (2010) Standard for the production and use of Waste Derived Fill, South Australia:
  - Waste Fill Criteria (WF)
  - Intermediate Waste Soil Criteria (IWS)
  - Low Level Contaminated Waste Criteria (LLCW).

Maximum permissible chemical concentrations for these waste classifications are referred to collectively as the soil disposal criteria and are presented in soil chemical summary tables.

In addition to chemical content, consideration was given to the physical requirements of WF as defined in the Environment Protection Regulations 2009. “Waste Fill” is defined as waste containing clay, concrete, rock, sand, soil or other inert mineralogical matter in pieces not exceeding 100 mm in length (but does not include waste consisting of asbestos or bitumen).

The SA EPA accepts use of the 95% Upper Confidence Limit (UCL) about the mean for establishing statistical contaminant concentration average for comparison to disposal criteria. However, for the 95% UCL to apply, the data set must be reviewed for potential hot spots of contamination via the following additional criteria:

- Maximum concentration less than 250% of the chemical criterion; and
- Standard deviation less than 50% of the chemical criterion.

Deviation from these cut off criteria may indicate the presence of anomalous or isolated hot spot concentrations, which may require segregation for appropriate risk management.

4. Results

The following section summarises the field observations and results of laboratory testing.

Detailed descriptions of the in-situ materials encountered, and depth intervals identified are summarised in the soil logs in **Attachment 2**. Tabulated laboratory analytical results are provided in **Attachment 3**.

4.1 Surface and Sub-surface Conditions

Fill material was encountered at all locations to a maximum depth of 0.6 mBGL at SB5 and generally consisted of a mix of fine to coarse grained grey brown gravelly/clayey sand, with low plasticity clay. Foreign inclusions in fill were noted as follows:

- Trace brick at SB3, SB5, SB7 (in two fill layers) and SB8
- Trace ash at SB5, SB7 (in two fill layers) and SB8
- Trace glass at SB7 (in two fill layers) and SB8.

Natural soils were encountered at all locations and generally consisted of low to medium plasticity, brown clay with trace fine to medium grained sand, grading to medium plasticity, brown/pale yellow silty sandy/silty gravelly clay, with fine to coarse grained sand and fine to medium gravel.

The highest PID reading noted was 0.1 ppmv, indicating concentrations of VOC's in soils on site were negligible.

A mechanic's service pit was noted inside the shed and soil bores SB3 and SB4 were drilled immediately adjacent to it.

4.2 Analytical Results

Chemical summary tables are presented in Attachment 3. Where a sample exceeded a relevant criterion, the concentration has been highlighted. Laboratory certificates and chain of custody documentation is provided in **Attachment 4**.

Various exceedances of the disposal criteria were noted across the site and are shown in Table 4-1.

Table 4-1: Samples exceeding soil disposal criteria

Analyte	Sample exceeding WF	Sample exceeding IWS	Sample exceeding LLCW
Benzo(a)pyrene	SB7-2	SB3-1, SB5-3	SB8-2
PAHs (sum of total)	SB3-1, SB5-3, SB7-2	SB8-2	-
TPH +C_{10}-C_{36} (sum of total)	-	SB7-2	-
TPH C_{10}-C_{40} (sum of total)	-	SB7-2	-
Arsenic	SB2-1, SB5-3, SB7-1, SB7-2	-	-
Copper	SB1-1, SB2-1, SB7-1, SB8-2	-	-

Analyte	Sample exceeding WF	Sample exceeding IWS	Sample exceeding LLCW
Lead	SB1-1, SB3-1, SB7-1, SB7-2, SB8-2	-	-
Zinc	SB1-1, SB3-1, SB7-1, SB7-2, SB8-2	-	-

Concentrations of chlorinated hydrocarbons, halogenated phenols, halogenated benzenes, halogenated hydrocarbons, herbicides, organochlorine pesticides, pesticides, polychlorinated biphenyls, solvents and MAH's were all below laboratory limits of reporting (LOR).

4.3 Leachate Results

ASLP analysis was requested for Sample SB1-1 for copper and zinc and for sample SB7-2 for arsenic and lead. All samples had concentrations above the laboratory LOR but below the maximum leachate concentration.

Sample SB8-2 had benzo(a)pyrene concentrations above Low Level Contaminated Waste criterion. The sample was submitted for MEP analysis and concentrations of benzo(a)pyrene and other PAH compounds in leachate were below the laboratory LOR for each extraction.

The results of the MEP analysis suggested the fill material complied with Low Level Contaminated Waste.

5. Data Validation

An evaluation of QA/QC information is provided in Table 5-1 below. This includes consideration of data quality objectives outlined in the ASC NEPM 1999 (as amended 2013) covering both field methodology and laboratory data integrity. As part of the evaluation, field duplicate sample chemical data were compared by determining the relative percentage difference (RPD) between the results. The RPD was calculated using the formula:

$$RPD\ (\%) = 100(x1 - x2) / X$$

Where x1, x2 are duplicate results and X is the mean of duplicate results

- Based on guidance provided in reference documents:
- Typically, acceptable RPD values for soil are considered to be +/-30%
- A soil RPD within the range of +/- 30% is considered to show acceptable agreement and conversely, data is considered to have poor agreement where an RPD is outside this range.

The acceptance criteria for internal laboratory replicates is set at an RPD of +/- 20%. Laboratory recoveries should be in the range of 70% to 130%. Duplicate RPDs and equipment rinsate and trip blank results are provided in **Attachment 3**. The results of internal laboratory quality control procedures are provided within the laboratory certificates in **Attachment 4**.

Table 5-1: Soil data validation

QA/QC Aspect	Compliant	Comment
COC documentation completed	Yes	All samples were transported under COC procedures.

QA/QC Aspect	Compliant	Comment
Samples delivered to the laboratory within sample holding times and in laboratory-supplied containers with the correct preservative	Mostly	All samples were delivered to the laboratories within the sample holding times and in laboratory-supplied containers, excluding MEP analysis of benzo(a)pyrene (PAHs). MEP analysis of sample SB8-2 for PAHs in soil was requested outside of the laboratory's recommended technical holding times. US EPA document "Sample Holding Time Re-evaluation" (October 2005) concluded that "*For the most part, the … representative PAHs exhibited stability for a length of time at least double that of the recommended MHT in all 3 soils/sediments and both storage conditions*" suggesting that the exceedance of technical holding time in this instance would not affect the results given the samples were within double the recommended MHT.
All analysis NATA accredited	Yes	Chemical analysis was undertaken in accordance with Shedule B(3) of the ASC NEPM. Envirolab and ALS performed all analysis and were NATA accredited for all analyses.
Equipment calibrations	Yes	The PID was calibrated by the rental company prior to the field event. PID calibration certificates are included in **Attachment 2**.
Required number of sample duplicates and blanks collected	Yes	Nine primary samples were selected for analysis. One duplicate sample was submitted for intra-laboratory analysis and one duplicate sample for inter-laboratory analysis, meeting recommendations in AS4482.1-2005 and ASC NEPM for nine primary samples. Equipment rinsate blank and trip blank samples were submitted for analysis.
Soil QA/QC samples reported RPDs within limits set by AS4482.1-2005 and ASC NEPM	Mostly	The majority of duplicate pair RPDs were within +/- 30% except for: • Lead (31%) for duplicate pair SB6-2/Dup 6 • TRH +C_{10}-C_{36} (sum of total) (69%) and TRH C_{10}-C_{40} (sum of total) (62%) for duplicate pair SB7-1/Dup 7. These RPD exceedances were likely due to the heterogeneous distribution of analytes in soil, and overall the analytical results indicated good data correlation between the primary and duplicate results.
Acceptable field blank sample results	Yes	Equipment rinsate blank and trip blank sample concentrations were below laboratory LOR, indicating field decontamination procedures and sample transportation procedures were effective at limiting the risk of cross-contamination between samples.
Acceptable laboratory QC results	Mostly	Envirolab reported duplicate exceedances for nickel and several TRH fractions and PAHs. Reanalysis of all duplicates indicated exceedances were likely due to sample heterogeneity. The remaining method blanks, laboratory control spikes and matrix spikes were within acceptable limits. ALS reported all internal and external laboratory duplicates, method blanks, laboratory control spikes and matrix spikes were within acceptable limits.

EP considered the results of the QA/QC processes and testing data summarised in Table 5-1 provided appropriate confidence that the data couple be relied upon, therefore the data quality was acceptable for the purposes of the assessment.

6. Conclusions

Laboratory MEP analysis for benzo(a)pyrene confirmed leachate concentrations in each extract were below the laboratory LOR and suggested the material complies with Low Level Contaminated Waste.

Laboratory ASLP analysis for metals (arsenic, copper, lead and zinc) confirmed concentrations of these metals in several samples complied with Intermediate Waste soils.

Based on the field observations and laboratory results of selected soil samples the fill material across site was classified as Low Level Contaminated waste and needs to be disposed of to a licensed landfill facility. Soil cartage needs to be completed by an appropriately licensed contractor.

The proposed receiving site should be provided with a copy of this report prior to transportation of soil to the site.

LIMITATIONS

Scope of Services

This environmental site assessment report (the report") has been prepared in accordance with the scope of services set out in the contract, or as otherwise agreed, between the client and Environmental Projects ("scope of services"). In some circumstances the scope of services may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

Reliance on Data

In preparing the report, Environmental Projects has relied upon data, surveys, analyses, designs and plans as well as any other information provided by the client and other individuals and organisations, most of which are referred to in the report ("the data"). Except as otherwise stated in the report, Environmental Projects has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report ("conclusions") are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. Environmental Projects will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to Environmental Projects.

Environmental Conclusions

In accordance with the scope of services, Environmental Projects has relied upon the data and conducted environmental field monitoring and/or testing in the preparation of the report. The nature and extent of monitoring and/or testing conducted is described in the report.

On all sites, varying degrees of non-uniformity of the vertical and horizontal soil or groundwater conditions are encountered. Hence no monitoring, common testing or sampling techniques can eliminate the possibility that monitoring or testing results/samples are not totally representative of soil and/or groundwater conditions encountered. The conclusions are based upon the data and the environmental field monitoring and/or testing and are therefore merely indicative of the environmental condition of the site at the time of preparing the report, including the presence or otherwise of contaminants or emissions.

Also, it should be recognised that site conditions, including the extent and concentrations of contaminants, can change with time.

Within the limitations imposed by the scope of services, the monitoring testing, sampling and preparation of this report have been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. No other warranty, expressed or implied, is made.

Report for Benefit of Client

The report has been prepared for the benefit of the client and no other party. Environmental Projects assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by

any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitations matters arising from any negligent act or omission of Environmental Projects or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own enquiries and obtain independent advice in relation to such matters

Other Limitations

Environmental Projects will not be liable to update or revise the report to take into account any events or emergent circumstances or facts occurring or becoming apparent after the date of the report.

Regards,

Brad Fitzgerald
Lead Consultant

Attachments

1. Figures
2. Soil Bore Logs
3. Chemical Summary Tables
4. Laboratory Certificates of Analysis and Chain of Custody Documentation

ATTACHMENT 1

0 80 160 m

N

Approximate site boundary

Figure 1

Site Location Plan

43 Main North Road,
Medindie SA 5081

Job name: Medindie Soil Sampling

Prepared for: Harcourts Williams Luxury

Job number: 19032.01

Drawn: AN
Date: 28/03/2019
Rev: A

environmental projects

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Adelaide 5000
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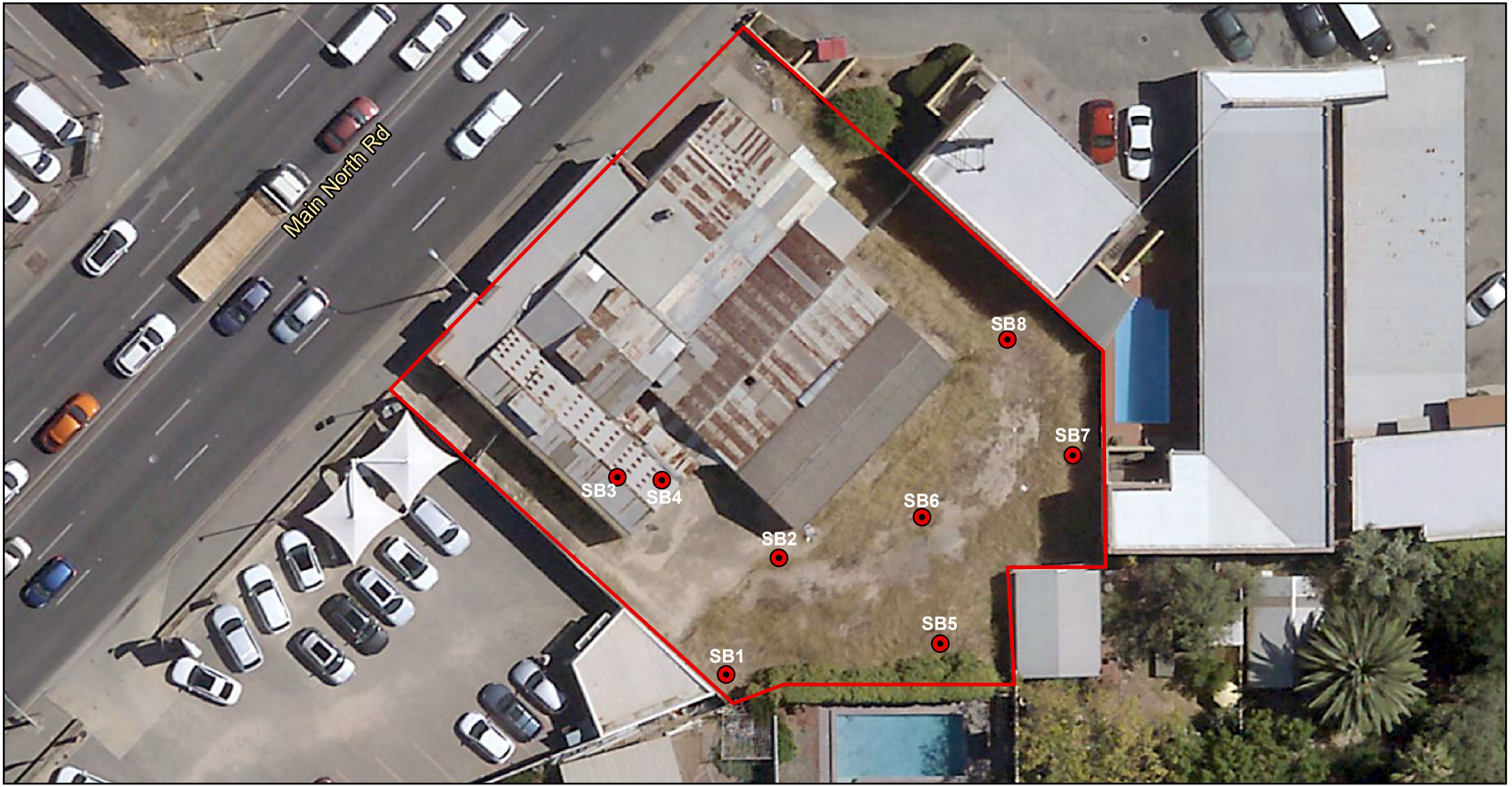

0 15 30 m

N

Approximate site boundary

Approximate soil bore location

Figure 2

Sample Location Plan

43 Main North Road,
Medindie SA 5081

Job name: Medindie Soil Sampling

Prepared for: Harcourts Williams Luxury

Job number: 19032.01

Drawn: AN
Date: 28/03/2019
Rev: A

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Adelaide 5000
www.environmentalprojects.com.au

ATTACHMENT 2

ENVIRONMENTAL SOIL BORE SB1

PROJECT NUMBER 19032.01
PROJECT NAME Medindie Soil Sampling
CLIENT Harcourts Williams Luxury
ADDRESS 43 Main North Rd, Medindie, SA

DATE 28/03/2019
DRILLING COMPANY Aussie Probe
DRILLER Chris Olsen
DRILLING METHOD Push tube
TOTAL DEPTH 1.0 mBGL

LOGGED BY J.Bermingham

COMMENTS

Depth (m)	Samples	PID	Duplicate	Graphic Log	Material Description	Moisture	Additional Observations
	SB1-1	4.0			FILL: Gravelly SAND, fine to coarse, grey, fine to medium gravels.	D	
	SB1-2	0.1			FILL: Clayey SAND, fine to medium, grey brown, low plasticity with fine to medium gravels.	D	
	SB1-3	0.1	Dup-1		CLAY, low plasticity, brown, trace fine grained sand.	D	
0.5							
	SB1-4	0			Silty Sandy CLAY, low to medium plasticity, pale yellow, fine to medium grained sand, trace fine gravels.	D	
	SB1-5	0					
1					End of hole at 1.0 mBGL.		

ENVIRONMENTAL SOIL BORE SB2

PROJECT NUMBER 19032.01
PROJECT NAME Medindie Soil Sampling
CLIENT Harcourts Williams Luxury
ADDRESS 43 Main North Rd, Medindie, SA

DATE 28/03/2019
DRILLING COMPANY Aussie Probe
DRILLER Chris Olsen
DRILLING METHOD Push tube
TOTAL DEPTH 1.0 mBGL

LOGGED BY J.Bermingham

COMMENTS

Depth (m)	Samples	PID	Duplicate	Graphic Log	Material Description	Moisture	Additional Observations
	SB2-1	0			FILL: CLAY, low plasticity, brown, trace fine to medium grained sand.	D	Fine to medium gravels at surface.
	SB2-2	0	Dup-2		Gravelly Silty CLAY, low to medium plasticity, mottled brown pale yellow, fine to medium gravels with fine to medium grained sand.	D	
0.5	SB2-3	0			Silty Sandy CLAY, low to medium plasticity, fine to medium grained sand with fine to medium gravels.	D	
	SB2-4	0					
1					End of hole at 1.0 mBGL.		

ENVIRONMENTAL SOIL BORE SB3

PROJECT NUMBER 19032.01
PROJECT NAME Medindie Soil Sampling
CLIENT Harcourts Williams Luxury
ADDRESS 43 Main North Rd, Medindie, SA

DATE 28/03/2019
DRILLING COMPANY Aussie Probe
DRILLER Chris Olsen
DRILLING METHOD Push tube
TOTAL DEPTH 1.0 mBGL

LOGGED BY J.Bermingham

COMMENTS Inside of shed, 0.7 metres away from pit.

Depth (m)	Samples	PID	Duplicate	Graphic Log	Material Description	Moisture	Additional Observations
					CONCRETE	D	
	SB3-1	0.1			FILL: Gravelly SAND, coarse grained, brown, fine to medium gravels, trace brick fragments.	D	
	SB3-2	0.1	Dup-3		CLAY, low to medium plasticity, brown with fine to medium grained sand, trace fine to medium gravels.	D	
0.5	SB3-3	0			Silty Sandy CLAY, low to medium plasticity, pale yellow, fine to medium grained sand with fine to medium gravels.	D	
	SB3-4	0					
1					End of hole at 1.0 mBGL.		

ENVIRONMENTAL SOIL BORE SB4

PROJECT NUMBER 19032.01
PROJECT NAME Medindie Soil Sampling
CLIENT Harcourts Williams Luxury
ADDRESS 43 Main North Rd, Medindie, SA

DATE 28/03/2019
DRILLING COMPANY Aussie Probe
DRILLER Chris Olsen
DRILLING METHOD Push tube
TOTAL DEPTH 1.0 mBGL

LOGGED BY J.Bermingham

COMMENTS Inside of shed, 0.4 metres away from pit.

Depth (m)	Samples	PID	Duplicate	Graphic Log	Material Description	Moisture	Additional Observations
					CONCRETE.		
	SB4-1	0.1			FILL: Gravelly CLAY, low plasticity, brown, fine to medium gravels.	D	
	SB4-2	0.1	Dup-4		Gravelly Silty Sandy CLAY, pale yellow, fine to medium grained sand with fine to medium gravels.	D	
0.5							
	SB4-3	0			Silty Sandy CLAY, low to medium plasticity, pale yellow, fine to medium grained sand with fine to medium gravels.	D	
	SB4-4	0					
1					End of hole at 1.0 mBGL.		

ENVIRONMENTAL SOIL BORE SB5

PROJECT NUMBER 19032.01
PROJECT NAME Medindie Soil Sampling
CLIENT Harcourts Williams Luxury
ADDRESS 43 Main North Rd, Medindie, SA

DATE 28/03/2019
DRILLING COMPANY Aussie Probe
DRILLER Chris Olsen
DRILLING METHOD Push tube
TOTAL DEPTH 1.0 mBGL

LOGGED BY J.Bermingham

COMMENTS

Depth (m)	Samples	PID	Duplicate	Graphic Log	Material Description	Moisture	Additional Observations
	SB5-1	0.1			FILL: Gravelly SAND, fine to coarse grained, grey, fine to medium gravels, trace brick fragments and ash.	D	
	SB5-2	0.1					
	SB5-3	0	Dup-5		FILL: CLAY, low to medium plasticity, brown, trace fine to medium grained sand.	D	Trace roots and ash to 0.4 mBGL.
0.5							
	SB5-4	0			Gravelly Silty Sandy CLAY, low to medium plasticity, pale yellow, fine grained sand with fine to medium gravels.	D	
	SB5-5	0					
1					End of hole at 1.0 mBGL.		

ENVIRONMENTAL SOIL BORE SB6

PROJECT NUMBER 19032.01
PROJECT NAME Medindie Soil Sampling
CLIENT Harcourts Williams Luxury
ADDRESS 43 Main North Rd, Medindie, SA

DATE 28/03/2019
DRILLING COMPANY Aussie Probe
DRILLER Chris Olsen
DRILLING METHOD Push tube
TOTAL DEPTH 1.0 mBGL

LOGGED BY J.Bermingham

COMMENTS

Depth (m)	Samples	PID	Duplicate	Graphic Log	Material Description	Moisture	Additional Observations
	SB6-1	0.1			FILL: Gravelly SAND, fine to coarse grained, grey, fine to medium gavels, brick fragments.	D	
	SB6-2	0	Dup-6		CLAY, low to medium plasticity, brown, trace fine grained sand.	D	
0.5							
	SB6-3	0			Silty Sandy CLAY, low to medium plasticity, pale yellow, fine to medium grained sand with fine gravels.	D	Gravel decreases with depth from 0.55 mBGL.
	SB6-4	0					
1					End of hole at 1.0 mBGL		

ENVIRONMENTAL SOIL BORE SB7

PROJECT NUMBER 19032.01
PROJECT NAME Medindie Soil Sampling
CLIENT Harcourts Williams Luxury
ADDRESS 43 Main North Rd, Medindie, SA

DATE 28/03/2019
DRILLING COMPANY Aussie Probe
DRILLER Chris Olsen
DRILLING METHOD Push tube
TOTAL DEPTH 1.0 mBGL

LOGGED BY J.Bermingham

COMMENTS

Depth (m)	Samples	PID	Duplicate	Graphic Log	Material Description	Moisture	Additional Observations
	SB7-1	0.1	Dup-7		FILL: Gravelly SAND, fine to medium grained, grey, fine to medium gravels with brick fragments and glass.	D	
	SB7-2	0.1			FILL: Clayey GRAVEL, fine to medium grained, grey, low plasticity with fine to coarse grained sand, trace ash, brick and glass fragments.	D	
	SB7-3	0			CLAY, low to medium plasticity, brown, trace roots.	D	Trace roots from 0.4 to 0.5 mBGL
0.5							
	SB7-4	0			Silty Sandy CLAY, medium plasticity, pale yellow, fine to coarse grained sand, trace fine to medium gravels.	D	
1					End of hole at 1.0 mBGL.		

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ENVIRONMENTAL SOIL BORE SB8

PROJECT NUMBER 19032.01
PROJECT NAME Medindie Soil Sampling
CLIENT Harcourts Williams Luxury
ADDRESS 43 Main North Rd, Medindie, SA

DATE 28/03/2019
DRILLING COMPANY Aussie Probe
DRILLER Chris Olsen
DRILLING METHOD Push tube
TOTAL DEPTH 1.0 mBGL

LOGGED BY J.Bermingham

COMMENTS

Depth (m)	Samples	PID	Duplicate	Graphic Log	Material Description	Moisture	Additional Observations
	SB8-1	0.1			FILL: Gravelly SAND, fine to coarse grained, grey, fine to medium gravels with ash, brick and glass fragments.	D	
	SB8-2	0.1					
	SB8-3	0	Dup-8		CLAY, low to medium plasticity, brown, trace fine to medium grained sand, trace roots.	D	
0.5							
	SB8-4	0			Silty Gravelly CLAY, medium plasticity, brown, fine to medium gravels with fine to coarse grained sand, trace roots.	D	
	SB8-5	0					
1					End of hole at 1.0 mBGL.		

produced by ESlog.ESdat.net on 05 Apr 2019

ATTACHMENT 3

Chemical Table - Disposal Criteria

	PAH																		
	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b+k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a.h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Pyrene	Phenanthrene	PAHs (Sum of total)	Benzo(a)pyrene TEQ	Benzo(a)pyrene TEQ calc (Half)	Benzo(a)pyrene TEQ (LOR)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.1	0.1	0.1	0.1	0.05	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.05	0.5	0.5	0.5
SA EPA- Waste Fill					1											5			
SA EPA- Intermediate Waste					2											40			
SA EPA- Low-level Contaminated Waste					5											200			

Field ID	Matrix Description	Date	Depth																	
SB1-1	FILL, Gravelly SAND	28/03/2019	0 - 0.1	<0.1	0.1	<0.1	0.4	0.57	1.0	0.6	0.4	0.1	0.4	<0.1	0.4	<0.1	0.6	<0.1	4.6	0.9	0.9	0.9
SB2-1	FILL, CLAY	28/03/2019	0 - 0.1													<1						
SB3-1	FILL, Gravelly SAND	28/03/2019	0.1 - 0.2	<0.1	0.6	0.6	2.8	3.8	6.1	3.2	2.6	0.6	4.1	0.2	2.4	0.1	4.0	2.4	34	5.5	5.5	5.5
SB4-1	FILL, Gravelly CLAY	28/03/2019	0.3 - 0.35													<1						
SB5-3	FILL, CLAY	28/03/2019	0.2 - 0.3	<0.1	0.3	0.2	1.8	2.4	3.9	1.8	1.7	0.4	2.9	<0.1	1.5	<0.1	2.8	0.7	20	3.5	3.5	3.5
SB6-2	CLAY	28/03/2019	0.15 - 0.25													<1						
SB7-1	FILL, Gravelly SAND	28/03/2019	0 - 0.1													<1						
SB7-2	FILL, Clayey GRAVEL	28/03/2019	0.15 - 0.25	<0.1	0.6	0.6	1.9	1.9	3.0	1.3	2.0	0.2	4.4	0.2	1	<0.1	4.2	3.6	25	2.8	2.8	2.8
SB8-2	FILL, Gravelly SAND	28/03/2019	0.2 - 0.3	<1	1.2	1.6	5.7	6.9	12	5.6	5.9	<1	11	<1	4.4	<1	11	5.0	70	9.2	9.7	10

Statistics

Mean																			
Maximum																			
Standard Deviation																			
95% UCL																			

Chemical Table - Disposal Criteria

				Metals											
				Arsenic	Beryllium	Boron	Cadmium	Chromium (hexavalent)	Chromium (III+VI)	Cobalt	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Zinc
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				4	1	3	0.4	1	1	1	1	1	1	0.1	1	2	1
SA EPA- Waste Fill				20	20		3	1		170	60	300	500	1	60		200
SA EPA- Intermediate Waste				200	40		30	200		170	2,000	1,200	6,000	30	600		14,000
SA EPA- Low-level Contaminated Waste				750	150		60	750		1,000	7,500	5,000	10,000	110	3,000		50,000
Field ID	**Matrix Description**	**Date**	**Depth**														
SB1-1	FILL, Gravelly SAND	28/03/2019	0 - 0.1	18			2		21		390	440		0.2	10		410
SB2-1	FILL, CLAY	28/03/2019	0 - 0.1	29			0.8		14		130	230		<0.1	8		190
SB3-1	FILL, Gravelly SAND	28/03/2019	0.1 - 0.2	8			0.9		8		29	360		<0.1	9		230
SB4-1	FILL, Gravelly CLAY	28/03/2019	0.3 - 0.35	<4			<0.4		12		10	8		<0.1	10		8
SB5-3	FILL, CLAY	28/03/2019	0.2 - 0.3	33			<0.4		18		21	170		<0.1	10		78
SB6-2	CLAY	28/03/2019	0.15 - 0.25	9			<0.4		22		13	41		<0.1	12		29
SB7-1	FILL, Gravelly SAND	28/03/2019	0 - 0.1	45			3		24		220	480		0.3	13		470
SB7-2	FILL, Clayey GRAVEL	28/03/2019	0.15 - 0.25	46			1		32		58	1,000		0.1	10		350
SB8-2	FILL, Gravelly SAND	28/03/2019	0.2 - 0.3	17	<1	10	0.9	<1	13	4	67	480	200	0.4	7	<2	390
Statistics																	
Mean				25.63													239.4
Maximum				46													470
Standard Deviation				15													174.5
95% UCL				33.08													347.6

Chemical Table - Disposal Criteria

				BTEX						TPH											
				Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	C6-C10	C6-C10 less BTEX (F1)	C10-C16	F2-NAPHTHALENE	C16-C34	C34-C40	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)	C10 - C40 (Sum of total)
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.2	0.5	0.5	1	0.5	1	25	25	50	50	100	100	25	50	100	100	50	50
SA EPA- Waste Fill				1	1.4	3.1			14							65				1,000	1,000
SA EPA- Intermediate Waste				5	50	100			180							100				1,000	1,000
SA EPA- Low-level Contaminated Waste				15	500	1,000			1,800							1,000				10,000	10,000
Field ID	**Matrix Description**	**Date**	**Depth**																		
SB1-1	FILL, Gravelly SAND	28/03/2019	0 - 0.1	<0.2	<0.5	<0.5	<1	<0.5	<1	<25	<25	<50	<50	<100	<100	<25	<50	<100	<100	<50	<50
SB2-1	FILL, CLAY	28/03/2019	0 - 0.1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<25	<50	<100	<100	<50	<50
SB3-1	FILL, Gravelly SAND	28/03/2019	0.1 - 0.2	<0.2	<0.5	<0.5	<1	<0.5	<1	<25	<25	<50	<50	150	<100	<25	<50	<100	<100	<50	150
SB4-1	FILL, Gravelly CLAY	28/03/2019	0.3 - 0.35	<0.2	<0.5	<0.5	<1	<0.5	<1	<25	<25	<50	<50	<100	<100	<25	<50	<100	<100	<50	<50
SB5-3	FILL, CLAY	28/03/2019	0.2 - 0.3	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<25	<50	<100	<100	<50	<50
SB6-2	CLAY	28/03/2019	0.15 - 0.25	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<25	<50	<100	<100	<50	<50
SB7-1	FILL, Gravelly SAND	28/03/2019	0 - 0.1	<0.2	<0.5	<0.5	<1	<0.5	<1	<25	<25	<50	<50	270	120	<25	<50	120	230	350	400
SB7-2	FILL, Clayey GRAVEL	28/03/2019	0.15 - 0.25	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	1,100	510	<25	<50	430	930	1,400	1,600
SB8-2	FILL, Gravelly SAND	28/03/2019	0.2 - 0.3	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	410	290	<25	<50	190	330	520	700
Statistics																					
Mean																					
Maximum																					
Standard Deviation																					
95% UCL																					

Chemical Table - Disposal Criteria

	Phenols											
	2,4-dimethylphenol	2,4-dinitrophenol	2,6-D	2-methylphenol	2-nitrophenol	4-chloro-3-methylphenol	4-methylphenol	4-nitrophenol	Picloram	Cresol Total	Phenol	Phenolics Total
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.2	2	0.5	0.2	0.2	2	0.4	4	0.5	0.2	0.2	0.2
SA EPA- Waste Fill												0.5
SA EPA- Intermediate Waste												17,000
SA EPA- Low-level Contaminated Waste												50,000
Field ID	**Matrix Description**	**Date**	**Depth**										
SB1-1	FILL, Gravelly SAND	28/03/2019	0 - 0.1										
SB2-1	FILL, CLAY	28/03/2019	0 - 0.1										
SB3-1	FILL, Gravelly SAND	28/03/2019	0.1 - 0.2										
SB4-1	FILL, Gravelly CLAY	28/03/2019	0.3 - 0.35										
SB5-3	FILL, CLAY	28/03/2019	0.2 - 0.3										
SB6-2	CLAY	28/03/2019	0.15 - 0.25										
SB7-1	FILL, Gravelly SAND	28/03/2019	0 - 0.1										
SB7-2	FILL, Clayey GRAVEL	28/03/2019	0.15 - 0.25										
SB8-2	FILL, Gravelly SAND	28/03/2019	0.2 - 0.3	<2	<20	<0.5	<2	<2	<20	<4	<40	<0.5	<0.2	<2	<0.2
Statistics													
Mean													
Maximum													
Standard Deviation													
95% UCL													

Chemical Table - Disposal Criteria

	Chlorinated Hydrocarbons															
	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,1-dichloroethene	1,1-dichloropropene	1,2,3-trichloropropane	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	2,2-dichloropropane	Bromochloromethane	Bromodichloromethane	Bromoform
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
SA EPA- Waste Fill																
SA EPA- Intermediate Waste																
SA EPA- Low-level Contaminated Waste																

Field ID	Matrix Description	Date	Depth															
SB1-1	FILL, Gravelly SAND	28/03/2019	0 - 0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SB2-1	FILL, CLAY	28/03/2019	0 - 0.1															
SB3-1	FILL, Gravelly SAND	28/03/2019	0.1 - 0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SB4-1	FILL, Gravelly CLAY	28/03/2019	0.3 - 0.35	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SB5-3	FILL, CLAY	28/03/2019	0.2 - 0.3															
SB6-2	CLAY	28/03/2019	0.15 - 0.25															
SB7-1	FILL, Gravelly SAND	28/03/2019	0 - 0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SB7-2	FILL, Clayey GRAVEL	28/03/2019	0.15 - 0.25															
SB8-2	FILL, Gravelly SAND	28/03/2019	0.2 - 0.3															

Statistics

Mean																
Maximum																
Standard Deviation																
95% UCL																

Chemical Table - Disposal Criteria

				Chlorinated Hydrocarbons												
				Carbon tetrachloride	Chlorodibromomethane	Chloroethane	Chloroform	Chloromethane	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Dibromomethane	Hexachlorobutadiene	Trichloroethene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Vinyl chloride
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.5	0.5	1	0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1
SA EPA- Waste Fill																	
SA EPA- Intermediate Waste														14			
SA EPA- Low-level Contaminated Waste														25.2			
Field ID	**Matrix Description**	**Date**	**Depth**														
SB1-1	FILL, Gravelly SAND	28/03/2019	0 - 0.1	<0.5	<0.5	<1	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1
SB2-1	FILL, CLAY	28/03/2019	0 - 0.1														
SB3-1	FILL, Gravelly SAND	28/03/2019	0.1 - 0.2	<0.5	<0.5	<1	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1
SB4-1	FILL, Gravelly CLAY	28/03/2019	0.3 - 0.35	<0.5	<0.5	<1	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1
SB5-3	FILL, CLAY	28/03/2019	0.2 - 0.3														
SB6-2	CLAY	28/03/2019	0.15 - 0.25														
SB7-1	FILL, Gravelly SAND	28/03/2019	0 - 0.1	<0.5	<0.5	<1	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1
SB7-2	FILL, Clayey GRAVEL	28/03/2019	0.15 - 0.25														
SB8-2	FILL, Gravelly SAND	28/03/2019	0.2 - 0.3														

Statistics

Mean																	
Maximum																	
Standard Deviation																	
95% UCL																	

Chemical Table - Disposal Criteria

				Halogenated Phenols							Halogenated Benzenes									
				2,3,4,6-tetrachlorophenol	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,6-dichlorophenol	2-chlorophenol	Pentachlorophenol	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	2-chlorotoluene	4-chlorotoluene	Bromobenzene	Chlorobenzene	Hexachlorobenzene
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.2	0.2	0.2	0.2	0.2	0.2	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.1
SA EPA- Waste Fill																				
SA EPA- Intermediate Waste																				
SA EPA- Low-level Contaminated Waste																				
Field ID	**Matrix Description**	**Date**	**Depth**																	
SB1-1	FILL, Gravelly SAND	28/03/2019	0 - 0.1								<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
SB2-1	FILL, CLAY	28/03/2019	0 - 0.1																	
SB3-1	FILL, Gravelly SAND	28/03/2019	0.1 - 0.2								<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
SB4-1	FILL, Gravelly CLAY	28/03/2019	0.3 - 0.35								<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
SB5-3	FILL, CLAY	28/03/2019	0.2 - 0.3																	
SB6-2	CLAY	28/03/2019	0.15 - 0.25																	
SB7-1	FILL, Gravelly SAND	28/03/2019	0 - 0.1								<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
SB7-2	FILL, Clayey GRAVEL	28/03/2019	0.15 - 0.25																	
SB8-2	FILL, Gravelly SAND	28/03/2019	0.2 - 0.3	<2	<2	<2	<2	<2	<2	<10										<1
Statistics																				
Mean																				
Maximum																				
Standard Deviation																				
95% UCL																				

Chemical Table - Disposal Criteria

				Herbicides																
				2,4,5-Trichlorophenoxy Acetic Acid	2,4,5-TP (Silvex)	Hedonal	2,4-dichlorophenoxybutanoic acid	2,4-Dichlorprop	2,4,6-Trichlorophenoxy-acetic acid	2-Chlorophenoxyacetic acid	4-Chlorophenoxy acetic acid	Acifluorfen	Atrazine	Bromoxynil	Clopyralid	Dicamba	Dinoseb	2-Methyl-4-chlorophenoxyacetic acid	2-Methyl-4-Chlorophenoxy Butanoic Acid	Mecoprop	Triclopyr
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5	0.5
SA EPA- Waste Fill																					
SA EPA- Intermediate Waste																					
SA EPA- Low-level Contaminated Waste																					
Field ID	**Matrix Description**	**Date**	**Depth**																		
SB1-1	FILL, Gravelly SAND	28/03/2019	0 - 0.1																		
SB2-1	FILL, CLAY	28/03/2019	0 - 0.1																		
SB3-1	FILL, Gravelly SAND	28/03/2019	0.1 - 0.2																		
SB4-1	FILL, Gravelly CLAY	28/03/2019	0.3 - 0.35																		
SB5-3	FILL, CLAY	28/03/2019	0.2 - 0.3																		
SB6-2	CLAY	28/03/2019	0.15 - 0.25																		
SB7-1	FILL, Gravelly SAND	28/03/2019	0 - 0.1																		
SB7-2	FILL, Clayey GRAVEL	28/03/2019	0.15 - 0.25																		
SB8-2	FILL, Gravelly SAND	28/03/2019	0.2 - 0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5
Statistics																					
Mean																					
Maximum																					
Standard Deviation																					
95% UCL																					

				Halogenated Hydrocarbons				Cyanides	MAH								
				1,2-dibromoethane	Bromomethane	Dichlorodifluoromethane	Trichlorofluoromethane	Cyanide (Free)	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	Isopropylbenzene	n-butylbenzene	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	Styrene	tert-butylbenzene
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.5	1	1	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
SA EPA- Waste Fill																	
SA EPA- Intermediate Waste																	
SA EPA- Low-level Contaminated Waste																	
Field ID	**Matrix Description**	**Date**	**Depth**														
SB1-1	FILL, Gravelly SAND	28/03/2019	0 - 0.1	<0.5	<1	<1	<1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SB2-1	FILL, CLAY	28/03/2019	0 - 0.1														
SB3-1	FILL, Gravelly SAND	28/03/2019	0.1 - 0.2	<0.5	<1	<1	<1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SB4-1	FILL, Gravelly CLAY	28/03/2019	0.3 - 0.35	<0.5	<1	<1	<1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SB5-3	FILL, CLAY	28/03/2019	0.2 - 0.3														
SB6-2	CLAY	28/03/2019	0.15 - 0.25														
SB7-1	FILL, Gravelly SAND	28/03/2019	0 - 0.1	<0.5	<1	<1	<1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SB7-2	FILL, Clayey GRAVEL	28/03/2019	0.15 - 0.25														
SB8-2	FILL, Gravelly SAND	28/03/2019	0.2 - 0.3					<0.5									
Statistics																	
Mean																	
Maximum																	
Standard Deviation																	
95% UCL																	

Chemical Table - Disposal Criteria

	Organochlorine Pesticides																				
	4,4-DDE	a-BHC	Aldrin	Dieldrin	Aldrin + Dieldrin	b-BHC	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Methoxychlor
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
SA EPA- Waste Fill					2						2								2		
SA EPA- Intermediate Waste					2						2								2		
SA EPA- Low-level Contaminated Waste					50						50								50		

Field ID	Matrix Description	Date	Depth																			
SB1-1	FILL, Gravelly SAND	28/03/2019	0 - 0.1																			
SB2-1	FILL, CLAY	28/03/2019	0 - 0.1																			
SB3-1	FILL, Gravelly SAND	28/03/2019	0.1 - 0.2																			
SB4-1	FILL, Gravelly CLAY	28/03/2019	0.3 - 0.35																			
SB5-3	FILL, CLAY	28/03/2019	0.2 - 0.3																			
SB6-2	CLAY	28/03/2019	0.15 - 0.25																			
SB7-1	FILL, Gravelly SAND	28/03/2019	0 - 0.1																			
SB7-2	FILL, Clayey GRAVEL	28/03/2019	0.15 - 0.25																			
SB8-2	FILL, Gravelly SAND	28/03/2019	0.2 - 0.3	<1	<1	<1	<0.1	<0.1	<1	<1	<1	<1	<1	<1	<0.1	<1	<1	<1	<1	<1	<1	<1	<1

Statistics

Mean																						
Maximum																						
Standard Deviation																						
95% UCL																						

Chemical Table - Disposal Criteria

	OPP	Other		Pesticides		Polychlorinated Biphenyls								Solvents	Inorganics	NA
	Chlorpyrifos	3,5-Dichlorobenzoic acid	Actril (loxynil)	Bifenthrin	Mirex	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	PCBs (Sum of total)	Cyclohexane	Moisture	DCPA (Chlorthal) Diacid
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg
EQL	0.1	0.5	1	0.5	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1	0.1	0.5
SA EPA- Waste Fill													2			
SA EPA- Intermediate Waste													2			
SA EPA- Low-level Contaminated Waste													50			
Field ID	**Matrix Description**	**Date**	**Depth**														
SB1-1	FILL, Gravelly SAND	28/03/2019	0 - 0.1												<1	4.1	
SB2-1	FILL, CLAY	28/03/2019	0 - 0.1													7.3	
SB3-1	FILL, Gravelly SAND	28/03/2019	0.1 - 0.2												<1	8.2	
SB4-1	FILL, Gravelly CLAY	28/03/2019	0.3 - 0.35												<1	17	
SB5-3	FILL, CLAY	28/03/2019	0.2 - 0.3													12	
SB6-2	CLAY	28/03/2019	0.15 - 0.25													14	
SB7-1	FILL, Gravelly SAND	28/03/2019	0 - 0.1												<1	4.6	
SB7-2	FILL, Clayey GRAVEL	28/03/2019	0.15 - 0.25													6.7	
SB8-2	FILL, Gravelly SAND	28/03/2019	0.2 - 0.3	<1	<0.5	<1	<5	<5	<1	<1	<1	<1	<1	<1	<1	7.4	<0.5
Statistics																	
Mean																	
Maximum																	
Standard Deviation																	
95% UCL																	

Duplicate Chemical Table

			PAH/Phenols	TRH											BTEX						
			Naphthalene	C6-C10	C6-C10 less BTEX (F1)	C10-C16	F2-NAPHTHALENE	C16-C34	C34-C40	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)	C10 - C40 (Sum of total)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Total BTEX	Xylene Total
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL			1	10	10	50	50	100	100	10	50	100	100	50	50	0.2	0.5	0.5	0.5	0.5	0.2	0.5
Field ID	**Date**	**Sample Type**																			
SB6-2	28/03/2019	Primary	<1	<25	<25	<50	<50	<100	<100	<25	<50	<100	<100	<50	<50	<0.2	<0.5	<1	<2	<1		<1
Dup-6	28/03/2019	Interlab Duplicate	<1	<10	<10	<50	<50	<100	<100	<10	<50	<100	<100	<50	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.2	<0.5
RPD			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
SB7-1	28/03/2019	Primary	<1	<25	<25	<50	<50	270	120	<25	<50	120	230	350	400	<0.2	<0.5	<0.5	<1	<0.5		<1
Dup-7	28/03/2019	Intralab Duplicate	<1	<25	<25	<50	<50	210	<100	<25	<50	<100	170	170	210	<0.2	<0.5	<1	<2	<1		<1
RPD			0	0	0	0	0	25	18	0	0	18	30	**69**	**62**	0	0	0	0	0		0

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**

****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 81 (1 - 10 x EQL); 50 (10 - 30 x EQL); 30 (> 30 x EQL))**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory**

Duplicate Chemical Table

			Metals								Inorganics	
			Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	Moisture Content	Moisture
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%
EQL			4	0.4	1	1	1	0.1	1	1	1	0.1
Field ID	**Date**	**Sample Type**										
SB6-2	28/03/2019	Primary	9	<0.4	22	13	41	<0.1	12	29		14
Dup-6	28/03/2019	Interlab Duplicate	10	<1	26	13	30	<0.1	14	30	14.4	
RPD			11	0	17	0	**31**	0	15	3		
SB7-1	28/03/2019	Primary	45	3	24	220	480	0.3	13	470		4.6
Dup-7	28/03/2019	Intralab Duplicate	43	4	24	250	540	0.4	14	520		4.9
RPD			5	29	0	13	12	29	7	10		6

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**

****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 81 (1 - 10 x EQL); 50 (10 - 30 x EQL); 30 (> 30 x EQL))**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory**

Chemical Table - ASLP Leachate

	Metals			
	Arsenic	Copper	Lead	Zinc
	mg/L	mg/L	mg/L	mg/L
EQL	0.05	0.01	0.03	0.02
SA EPA- Waste Fill				
SA EPA- Intermediate Waste	5	10	5	250
SA EPA- Low-level Contaminated Waste				

Field ID	Date				
SB1-1	28/03/2019		0.2		0.5
SB7-2	28/03/2019	0.2		0.5	

	PAH														
	Acenaphthene (filtered)	Acenaphthylene (filtered)	Anthracene (filtered)	Benz(a)anthracene (filtered)	Benzo(a) pyrene (filtered)	Benzo(b+k)fluoranthene (filtered)	Benzo(g,h,i)perylene (filtered)	Chrysene (filtered)	Dibenz(a,h)anthracene (filtered)	Fluoranthene (filtered)	Fluorene (filtered)	Indeno(1,2,3-c,d)pyrene (filtered)	Naphthalene (filtered)	Phenanthrene (filtered)	Pyrene (filtered)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
SA EPA- Waste Fill															
SA EPA- Intermediate Waste															
SA EPA- Low-level Contaminated Waste					1										

Field ID	Date															
SB8-2-EP	28/03/2019	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1
SB8-2-MEP1	28/03/2019	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1
SB8-2-MEP2	28/03/2019	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1
SB8-2-MEP3	28/03/2019	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1
SB8-2-MEP4	28/03/2019	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1
SB8-2-MEP5	28/03/2019	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1
SB8-2-MEP6	28/03/2019	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1
SB8-2-MEP7	28/03/2019	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1
SB8-2-MEP8	28/03/2019	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1
SB8-2-MEP9	28/03/2019	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1

ATTACHMENT 4

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CERTIFICATE OF ANALYSIS 16416

Client Details

Client	Environmental Projects
Attention	Brad Fitzgerald
Address	Level 3, 117 King William St, Adelaide, SA, 5000

Sample Details

Your Reference	**19032.01 Medindie Soil Sampling**
Number of Samples	2 Water, 42 Soil
Date samples received	29/03/2019
Date completed instructions received	29/03/2019

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	05/04/2019
Date of Issue	05/04/2019

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Results Approved By
Chris De Luca, Operations Manager

Authorised By

Pamela Adams, Laboratory Manager

VOCs in soil					
Our Reference		16416-3	16416-12	16416-16	16416-29
Your Reference	UNITS	SB1-1	SB3-1	SB4-1	SB7-1
Depth		0.0-0.1	0.1-0.2	0.3-0.35	0.0-0.1
Date Sampled		28/03/2019	28/03/2019	28/03/2019	28/03/2019
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	02/04/2019	02/04/2019	02/04/2019
Dichlorodifluoromethane	mg/kg	<1	<1	<1	<1
Chloromethane	mg/kg	<1	<1	<1	<1
Vinyl Chloride	mg/kg	<1	<1	<1	<1
Bromomethane	mg/kg	<1	<1	<1	<1
Chloroethane	mg/kg	<1	<1	<1	<1
Trichlorofluoromethane	mg/kg	<1	<1	<1	<1
1,1-Dichloroethene	mg/kg	<0.5	<0.5	<0.5	<0.5
trans-1,2-dichloroethene	mg/kg	<0.5	<0.5	<0.5	<0.5
1,1-dichloroethane	mg/kg	<0.5	<0.5	<0.5	<0.5
cis-1,2-dichloroethene	mg/kg	<0.5	<0.5	<0.5	<0.5
bromochloromethane	mg/kg	<0.5	<0.5	<0.5	<0.5
chloroform	mg/kg	<0.5	<0.5	<0.5	<0.5
2,2-dichloropropane	mg/kg	<0.5	<0.5	<0.5	<0.5
1,2-dichloroethane	mg/kg	<0.5	<0.5	<0.5	<0.5
1,1,1-trichloroethane	mg/kg	<0.5	<0.5	<0.5	<0.5
1,1-dichloropropene	mg/kg	<0.5	<0.5	<0.5	<0.5
Cyclohexane	mg/kg	<1	<1	<1	<1
carbon tetrachloride	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2
dibromomethane	mg/kg	<0.5	<0.5	<0.5	<0.5
1,2-dichloropropane	mg/kg	<0.5	<0.5	<0.5	<0.5
trichloroethene	mg/kg	<0.5	<0.5	<0.5	<0.5
bromodichloromethane	mg/kg	<0.5	<0.5	<0.5	<0.5
trans-1,3-dichloropropene	mg/kg	<0.5	<0.5	<0.5	<0.5
cis-1,3-dichloropropene	mg/kg	<0.5	<0.5	<0.5	<0.5
1,1,2-trichloroethane	mg/kg	<0.5	<0.5	<0.5	<0.5
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5
1,3-dichloropropane	mg/kg	<0.5	<0.5	<0.5	<0.5
dibromochloromethane	mg/kg	<0.5	<0.5	<0.5	<0.5
1,2-dibromoethane	mg/kg	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	mg/kg	<0.5	<0.5	<0.5	<0.5
1,1,1,2-tetrachloroethane	mg/kg	<0.5	<0.5	<0.5	<0.5
chlorobenzene	mg/kg	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<0.5	<0.5	<0.5	<0.5

VOCs in soil					
Our Reference		16416-3	16416-12	16416-16	16416-29
Your Reference	UNITS	SB1-1	SB3-1	SB4-1	SB7-1
Depth		0.0-0.1	0.1-0.2	0.3-0.35	0.0-0.1
Date Sampled		28/03/2019	28/03/2019	28/03/2019	28/03/2019
Type of sample		Soil	Soil	Soil	Soil
bromoform	mg/kg	<0.5	<0.5	<0.5	<0.5
m+p-xylene	mg/kg	<1	<1	<1	<1
styrene	mg/kg	<0.5	<0.5	<0.5	<0.5
1,1,2,2-tetrachloroethane	mg/kg	<0.5	<0.5	<0.5	<0.5
o-Xylene	mg/kg	<0.5	<0.5	<0.5	<0.5
1,2,3-trichloropropane	mg/kg	<0.5	<0.5	<0.5	<0.5
isopropylbenzene	mg/kg	<0.5	<0.5	<0.5	<0.5
bromobenzene	mg/kg	<0.5	<0.5	<0.5	<0.5
n-propyl benzene	mg/kg	<0.5	<0.5	<0.5	<0.5
2-chlorotoluene	mg/kg	<0.5	<0.5	<0.5	<0.5
4-chlorotoluene	mg/kg	<0.5	<0.5	<0.5	<0.5
1,3,5-trimethyl benzene	mg/kg	<0.5	<0.5	<0.5	<0.5
tert-butyl benzene	mg/kg	<0.5	<0.5	<0.5	<0.5
1,2,4-trimethyl benzene	mg/kg	<0.5	<0.5	<0.5	<0.5
1,3-dichlorobenzene	mg/kg	<0.5	<0.5	<0.5	<0.5
sec-butyl benzene	mg/kg	<0.5	<0.5	<0.5	<0.5
1,4-dichlorobenzene	mg/kg	<0.5	<0.5	<0.5	<0.5
4-isopropyl toluene	mg/kg	<0.5	<0.5	<0.5	<0.5
1,2-dichlorobenzene	mg/kg	<0.5	<0.5	<0.5	<0.5
n-butyl benzene	mg/kg	<0.5	<0.5	<0.5	<0.5
1,2-dibromo-3-chloropropane	mg/kg	<0.5	<0.5	<0.5	<0.5
1,2,4-trichlorobenzene	mg/kg	<0.5	<0.5	<0.5	<0.5
hexachlorobutadiene	mg/kg	<0.5	<0.5	<0.5	<0.5
1,2,3-trichlorobenzene	mg/kg	<0.5	<0.5	<0.5	<0.5
Surrogate Dibromofluoromethane	%	106	104	105	106
Surrogate aaa-Trifluorotoluene	%	91	92	89	92
Surrogate Toluene-d_8	%	99	99	99	98
Surrogate 4-Bromofluorobenzene	%	95	94	94	94

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		16416-3	16416-8	16416-12	16416-16	16416-22
Your Reference	UNITS	SB1-1	SB2-1	SB3-1	SB4-1	SB5-3
Depth		0.0-0.1	0.0-0.1	0.1-0.2	0.3-0.35	0.2-0.3
Date Sampled		28/03/2019	28/03/2019	28/03/2019	28/03/2019	28/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	03/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
vTRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
vTRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	103	101	101	97	100

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		16416-26	16416-29	16416-30	16416-34	16416-43
Your Reference	UNITS	SB6-2	SB7-1	SB7-2	SB8-2	Dup-7
Depth		0.15-0.25	0.0-0.1	0.15-0.25	0.2-0.3	-
Date Sampled		28/03/2019	28/03/2019	28/03/2019	28/03/2019	28/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
vTRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
vTRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	96	100	100	99	99

TRH Soil C10-C40 NEPM						
Our Reference		16416-3	16416-8	16416-12	16416-16	16416-22
Your Reference	UNITS	SB1-1	SB2-1	SB3-1	SB4-1	SB5-3
Depth		0.0-0.1	0.0-0.1	0.1-0.2	0.3-0.35	0.2-0.3
Date Sampled		28/03/2019	28/03/2019	28/03/2019	28/03/2019	28/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	01/04/2019	02/04/2019
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	150	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	150	<50	<50
Surrogate o-Terphenyl	%	83	82	83	84	82

TRH Soil C10-C40 NEPM						
Our Reference		16416-26	16416-29	16416-30	16416-34	16416-43
Your Reference	UNITS	SB6-2	SB7-1	SB7-2	SB8-2	Dup-7
Depth		0.15-0.25	0.0-0.1	0.15-0.25	0.2-0.3	-
Date Sampled		28/03/2019	28/03/2019	28/03/2019	28/03/2019	28/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	01/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	120	430	190	<100
TRH C_{29} - C_{36}	mg/kg	<100	230	930	330	170
Total +ve TRH (C10-C36)	mg/kg	<50	350	1,400	520	170
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	270	1,100	410	210
TRH >C_{34} -C_{40}	mg/kg	<100	120	510	290	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	400	1,600	700	210
Surrogate o-Terphenyl	%	85	84	88	82	81

TRH Soil C10-C40 NEPM		
Our Reference		16416-46
Your Reference	UNITS	SB8-2 - Triplicate
Depth		0.2-0.3
Date Sampled		28/03/2019
Type of sample		Soil
Date extracted	-	01/04/2019
Date analysed	-	02/04/2019
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	110
TRH C_{29} - C_{36}	mg/kg	240
Total +ve TRH (C10-C36)	mg/kg	340
TRH >C_{10} -C_{16}	mg/kg	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50
TRH >C_{16} -C_{34}	mg/kg	260
TRH >C_{34} -C_{40}	mg/kg	220
Total +ve TRH (>C10-C40)	mg/kg	480
Surrogate o-Terphenyl	%	79

PAHs in Soil						
Our Reference		16416-3	16416-12	16416-22	16416-30	16416-34
Your Reference	UNITS	SB1-1	SB3-1	SB5-3	SB7-2	SB8-2
Depth		0.0-0.1	0.1-0.2	0.2-0.3	0.15-0.25	0.2-0.3
Date Sampled		28/03/2019	28/03/2019	28/03/2019	28/03/2019	28/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Naphthalene	mg/kg	<0.1	0.1	<0.1	<0.1	<1
Acenaphthylene	mg/kg	0.1	0.6	0.3	0.6	1.2
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<1
Fluorene	mg/kg	<0.1	0.2	<0.1	0.2	<1
Phenanthrene	mg/kg	<0.1	2.4	0.7	3.6	5.0
Anthracene	mg/kg	<0.1	0.6	0.2	0.6	1.6
Fluoranthene	mg/kg	0.4	4.1	2.9	4.4	11
Pyrene	mg/kg	0.6	4.0	2.8	4.2	11
Benzo(a)anthracene	mg/kg	0.4	2.8	1.8	1.9	5.7
Chrysene	mg/kg	0.4	2.6	1.7	2.0	5.9
Benzo(b,j&k)fluoranthene	mg/kg	1.0	6.1	3.9	3.0	12
Benzo(a)pyrene	mg/kg	0.57	3.8	2.4	1.9	6.9
Indeno(1,2,3-c,d)pyrene	mg/kg	0.4	2.4	1.5	1	4.4
Dibenzo(a,h)anthracene	mg/kg	0.1	0.6	0.4	0.2	<1
Benzo(g,h,i)perylene	mg/kg	0.6	3.2	1.8	1.3	5.6
Total +ve PAH's	mg/kg	4.6	34	20	25	70
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0.9	5.5	3.5	2.8	9.2
Benzo(a)pyrene TEQ calc (Half)	mg/kg	0.9	5.5	3.5	2.8	9.7
Benzo(a)pyrene TEQ calc (PQL)	mg/kg	0.9	5.5	3.5	2.8	10
Surrogate p-Terphenyl-d_{14}	%	98	92	92	90	90

PAHs in Soil		
Our Reference		16416-46
Your Reference	UNITS	SB8-2 - Triplicate
Depth		0.2-0.3
Date Sampled		28/03/2019
Type of sample		Soil
Date extracted	-	01/04/2019
Date analysed	-	04/04/2019
Naphthalene	mg/kg	<1
Acenaphthylene	mg/kg	<1
Acenaphthene	mg/kg	<1
Fluorene	mg/kg	<1
Phenanthrene	mg/kg	<1
Anthracene	mg/kg	<1
Fluoranthene	mg/kg	4.6
Pyrene	mg/kg	5.0
Benzo(a)anthracene	mg/kg	3.2
Chrysene	mg/kg	3.3
Benzo(b,j&k)fluoranthene	mg/kg	7.9
Benzo(a)pyrene	mg/kg	4.6
Indeno(1,2,3-c,d)pyrene	mg/kg	3.2
Dibenzo(a,h)anthracene	mg/kg	<1
Benzo(g,h,i)perylene	mg/kg	4.2
Total +ve PAH's	mg/kg	36
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	6.1
Benzo(a)pyrene TEQ calc (Half)	mg/kg	6.6
Benzo(a)pyrene TEQ calc (PQL)	mg/kg	7.1
Surrogate p-Terphenyl-d_{14}	%	88

Speciated Phenols in Soil		
Our Reference		16416-34
Your Reference	UNITS	SB8-2
Depth		0.2-0.3
Date Sampled		28/03/2019
Type of sample		Soil
Date extracted	-	01/04/2019
Date analysed	-	04/04/2019
Phenol	mg/kg	<2
2-Chlorophenol	mg/kg	<2
2-Methylphenol	mg/kg	<2
3/4-Methylphenol	mg/kg	<4
2-Nitrophenol	mg/kg	<2
2,4-Dimethylphenol	mg/kg	<2
2,4-Dichlorophenol	mg/kg	<2
2,6-Dichlorophenol	mg/kg	<2
2,4,5-Trichlorophenol	mg/kg	<2
2,4,6-Trichlorophenol	mg/kg	<2
2,4-Dinitrophenol	mg/kg	<20
4-Nitrophenol	mg/kg	<40
2,3,4,6-Tetrachlorophenol	mg/kg	<2
Pentachlorophenol	mg/kg	<10
4-Chloro-3-Methylphenol	mg/kg	<20
Total +ve Cresols	mg/kg	<0.2
Total +ve Phenols	mg/kg	<0.2
Surrogate Phenol-d_6	%	100

OCP in Soil - NEPM		
Our Reference		16416-34
Your Reference	UNITS	SB8-2
Depth		0.2-0.3
Date Sampled		28/03/2019
Type of sample		Soil
Date extracted	-	01/04/2019
Date analysed	-	04/04/2019
alpha-BHC	mg/kg	<1
Hexachlorobenzene	mg/kg	<1
beta-BHC	mg/kg	<1
gamma-BHC	mg/kg	<1
Heptachlor	mg/kg	<1
delta-BHC	mg/kg	<1
Aldrin	mg/kg	<1
Heptachlor Epoxide	mg/kg	<1
gamma-Chlordane	mg/kg	<1
alpha-chlordane	mg/kg	<1
Endosulfan I	mg/kg	<1
pp-DDE	mg/kg	<1
Dieldrin	mg/kg	<1
Endrin	mg/kg	<1
Endosulfan II	mg/kg	<1
pp-DDD	mg/kg	<1
Endrin Aldehyde	mg/kg	<1
pp-DDT	mg/kg	<1
Endosulfan Sulphate	mg/kg	<1
Methoxychlor	mg/kg	<1
Total +ve reported Aldrin + Dieldrin	mg/kg	<0.1
Total +ve reported DDT+DDD+DDE	mg/kg	<0.1
Mirex	mg/kg	<5
Surrogate p-Terphenyl-d_{14}	%	90

OP in Soil - NEPM		
Our Reference		16416-34
Your Reference	UNITS	SB8-2
Depth		0.2-0.3
Date Sampled		28/03/2019
Type of sample		Soil
Date extracted	-	01/04/2019
Date analysed	-	04/04/2019
Chlorpyrifos	mg/kg	<1
Surrogate p-Terphenyl-d_{14}	%	90

PCBs in Soil		
Our Reference		16416-34
Your Reference	UNITS	SB8-2
Depth		0.2-0.3
Date Sampled		28/03/2019
Type of sample		Soil
Date extracted	-	01/04/2019
Date analysed	-	04/04/2019
Aroclor 1016	mg/kg	<1
Aroclor 1221	mg/kg	<1
Aroclor 1232	mg/kg	<1
Aroclor 1242	mg/kg	<1
Aroclor 1248	mg/kg	<1
Aroclor 1254	mg/kg	<1
Aroclor 1260	mg/kg	<1
Total +ve PCBs (1016-1260)	mg/kg	<1
Surrogate p-Terphenyl-d_{14}	%	90

Synthetic Pyrethroids - NEPM		
Our Reference		16416-34
Your Reference	UNITS	SB8-2
Depth		0.2-0.3
Date Sampled		28/03/2019
Type of sample		Soil
Date extracted	-	01/04/2019
Date analysed	-	04/04/2019
Bifenthrin	mg/kg	<5

Triazine Herbicides in Soil		
Our Reference		16416-34
Your Reference	UNITS	SB8-2
Depth		0.2-0.3
Date Sampled		28/03/2019
Type of sample		Soil
Date extracted	-	01/04/2019
Date analysed	-	04/04/2019
Atrazine	mg/kg	<5

Phenoxy Acid Herbicides in Soil		
Our Reference		16416-34
Your Reference	UNITS	SB8-2
Depth		0.2-0.3
Date Sampled		28/03/2019
Type of sample		Soil
Date Extracted	-	01/04/2019
Date analysed	-	03/04/2019
Clopyralid	mg/kg	<0.5
3,5-Dichlorobenzoic acid	mg/kg	<0.5
o-Chlorophenoxy acetic acid	mg/kg	<0.5
4-CPA	mg/kg	<0.5
Dicamba	mg/kg	<0.5
Mecoprop	mg/kg	<0.5
MCPA	mg/kg	<0.5
Dichloroprop	mg/kg	<0.5
2,4-D	mg/kg	<0.5
Bromoxynil	mg/kg	<0.5
Triclopyr	mg/kg	<0.5
2,4,5-TP (Silvex)	mg/kg	<0.5
2,4,5-T	mg/kg	<0.5
MCPB	mg/kg	<0.5
Dinoseb	mg/kg	<1
2.4-DB	mg/kg	<0.5
Ioxynil	mg/kg	<1
Picloram	mg/kg	<0.5
DCPA (Chlorthal) Diacid	mg/kg	<0.5
Acifluorfen	mg/kg	<2
2,4,6-T	mg/kg	<0.5
2,6-D	mg/kg	<0.5
Surrogate: 2,4-DCPA	%	96

NEPM screen metals in soil						
Our Reference		16416-3	16416-8	16416-12	16416-16	16416-22
Your Reference	UNITS	SB1-1	SB2-1	SB3-1	SB4-1	SB5-3
Depth		0.0-0.1	0.0-0.1	0.1-0.2	0.3-0.35	0.2-0.3
Date Sampled		28/03/2019	28/03/2019	28/03/2019	28/03/2019	28/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Arsenic	mg/kg	18	29	8	<4	33
Cadmium	mg/kg	2	0.8	0.9	<0.4	<0.4
Chromium	mg/kg	21	14	8	12	18
Copper	mg/kg	390	130	29	10	21
Lead	mg/kg	440	230	360	8	170
Mercury	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	10	8	9	10	10
Zinc	mg/kg	410	190	230	8	78

NEPM screen metals in soil						
Our Reference		16416-26	16416-29	16416-30	16416-34	16416-43
Your Reference	UNITS	SB6-2	SB7-1	SB7-2	SB8-2	Dup-7
Depth		0.15-0.25	0.0-0.1	0.15-0.25	0.2-0.3	-
Date Sampled		28/03/2019	28/03/2019	28/03/2019	28/03/2019	28/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Arsenic	mg/kg	9	45	46	17	43
Cadmium	mg/kg	<0.4	3	1	0.9	4
Chromium	mg/kg	22	24	32	13	24
Copper	mg/kg	13	220	58	67	250
Lead	mg/kg	41	480	1,000	480	540
Mercury	mg/kg	<0.1	0.3	0.1	0.4	0.4
Nickel	mg/kg	12	13	10	7	14
Zinc	mg/kg	29	470	350	390	520
Beryllium	mg/kg	[NA]	[NA]	[NA]	<1	[NA]
Boron	mg/kg	[NA]	[NA]	[NA]	10	[NA]
Cobalt	mg/kg	[NA]	[NA]	[NA]	4	[NA]
Manganese	mg/kg	[NA]	[NA]	[NA]	200	[NA]
Selenium	mg/kg	[NA]	[NA]	[NA]	<2	[NA]

NEPM screen metals in soil		
Our Reference		16416-45
Your Reference	UNITS	SB3-1 - Triplicate
Depth		0.1-0.2
Date Sampled		28/03/2019
Type of sample		Soil
Date digested	-	01/04/2019
Date analysed	-	02/04/2019
Nickel	mg/kg	6

Misc Inorg - soil NEPM		
Our Reference		16416-34
Your Reference	UNITS	SB8-2
Depth		0.2-0.3
Date Sampled		28/03/2019
Type of sample		Soil
Date prepared	-	01/04/2019
Date analysed	-	03/04/2019
Free Cyanide in soil	mg/kg	<0.5
Hexavalent Chromium, Cr^{6+}	mg/kg	<1

Moisture						
Our Reference		16416-3	16416-8	16416-12	16416-16	16416-22
Your Reference	UNITS	SB1-1	SB2-1	SB3-1	SB4-1	SB5-3
Depth		0.0-0.1	0.0-0.1	0.1-0.2	0.3-0.35	0.2-0.3
Date Sampled		28/03/2019	28/03/2019	28/03/2019	28/03/2019	28/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Moisture	%	4.1	7.3	8.2	17	12

Moisture						
Our Reference		16416-26	16416-29	16416-30	16416-34	16416-43
Your Reference	UNITS	SB6-2	SB7-1	SB7-2	SB8-2	Dup-7
Depth		0.15-0.25	0.0-0.1	0.15-0.25	0.2-0.3	-
Date Sampled		28/03/2019	28/03/2019	28/03/2019	28/03/2019	28/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	01/04/2019	01/04/2019	01/04/2019	01/04/2019	01/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Moisture	%	14	4.6	6.7	7.4	4.9

vTRH(C6-C10)/BTEXN in Water		
Our Reference		16416-1
Your Reference	UNITS	TB
Depth		-
Date Sampled		28/03/2019
Type of sample		Water
Date extracted	-	02/04/2019
Date analysed	-	02/04/2019
TRH C_6 - C_9	µg/L	<10
TRH C_6 - C_{10}	µg/L	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Total +ve Xylenes	µg/L	<1
Surrogate Dibromofluoromethane	%	113
Surrogate toluene-d8	%	100
Surrogate 4-BFB	%	102

Metals in Waters - Total		
Our Reference		16416-2
Your Reference	UNITS	EB
Depth		-
Date Sampled		28/03/2019
Type of sample		Water
Date prepared	-	01/04/2019
Date analysed	-	01/04/2019
Arsenic - Total	mg/L	<0.05
Barium - Total	mg/L	<0.01
Beryllium - Total	mg/L	<0.01
Boron - Total	mg/L	<0.2
Cadmium - Total	mg/L	<0.01
Chromium - Total	mg/L	<0.01
Cobalt - Total	mg/L	<0.02
Copper - Total	mg/L	<0.01
Lead - Total	mg/L	<0.03
Manganese - Total	mg/L	<0.01
Mercury-Total	µg/L	<0.05
Nickel - Total	mg/L	<0.02
Zinc - Total	mg/L	<0.02

Method ID	Methodology Summary
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 12 hours.
Inorg-013	Cyanide - total determined colourimetrically after distillation, based on APHA latest edition, 4500-CN_C,E. Free cyanide determined colourimetrically after filtration and confirmed by diffusion. Solids are extracted in a caustic media prior to distillation and analysis.
Inorg-024	Hexavalent Chromium (Cr6+) - determined colourimetrically by discrete analyser.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Note, For OCs the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Note, the Total +ve Cresols or Phenols PQL is reflective of the lowest individual PQL and is therefore" Total +ve Cresols or Phenols" is simply a sum of the positive individual Cresols or Phenols.

Method ID	Methodology Summary
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-012	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD or GC-MS. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-013	Water samples are analysed directly by purge and trap GC-MS.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.
ORG-031	Acid herbicides and speciated phenols in soil by DCM:Acetone extraction with derivatisation and determination by GC-MS. Haloacetic acids in waters are derivatised and analysed by GC-ECD. Acid herbicides, speciated phenols, carbamates and ureas in water by DCM extraction with derivatisation and determination by GC-MS. Analysed by MPL, NATA accrediation 2901.

QUALITY CONTROL: VOCs in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	16416-16
Date extracted	-			01/04/2019	12	01/04/2019	01/04/2019		[NT]	01/04/2019
Date analysed	-			03/04/2019	12	02/04/2019	02/04/2019		[NT]	02/04/2019
Dichlorodifluoromethane	mg/kg	1	Org-014	<1	12	<1	<1	0	[NT]	[NT]
Chloromethane	mg/kg	1	Org-014	<1	12	<1	<1	0	[NT]	[NT]
Vinyl Chloride	mg/kg	1	Org-014	<1	12	<1	<1	0	[NT]	[NT]
Bromomethane	mg/kg	1	Org-014	<1	12	<1	<1	0	[NT]	[NT]
Chloroethane	mg/kg	1	Org-014	<1	12	<1	<1	0	[NT]	[NT]
Trichlorofluoromethane	mg/kg	1	Org-014	<1	12	<1	<1	0	[NT]	[NT]
1,1-Dichloroethene	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
trans-1,2-dichloroethene	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
1,1-dichloroethane	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	89
cis-1,2-dichloroethene	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
bromochloromethane	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
chloroform	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	92
2,2-dichloropropane	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
1,2-dichloroethane	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	88
1,1,1-trichloroethane	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	92
1,1-dichloropropene	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
Cyclohexane	mg/kg	1	Org-014	<1	12	<1	<1	0	[NT]	[NT]
carbon tetrachloride	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-014	<0.2	12	<0.2	<0.2	0	[NT]	[NT]
dibromomethane	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
1,2-dichloropropane	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
trichloroethene	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	95
bromodichloromethane	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	101
trans-1,3-dichloropropene	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
cis-1,3-dichloropropene	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
1,1,2-trichloroethane	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
1,3-dichloropropane	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
dibromochloromethane	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	106
1,2-dibromoethane	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
Tetrachloroethene	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	91
1,1,1,2-tetrachloroethane	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
chlorobenzene	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
bromoform	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
m+p-xylene	mg/kg	1	Org-014	<1	12	<1	<1	0	[NT]	[NT]
styrene	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
o-Xylene	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]

QUALITY CONTROL: VOCs in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	16416-16
1,2,3-trichloropropane	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
isopropylbenzene	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
bromobenzene	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
n-propyl benzene	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
2-chlorotoluene	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
4-chlorotoluene	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
1,3,5-trimethyl benzene	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
tert-butyl benzene	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
1,2,4-trimethyl benzene	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
1,3-dichlorobenzene	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
sec-butyl benzene	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
1,4-dichlorobenzene	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
4-isopropyl toluene	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
1,2-dichlorobenzene	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
n-butyl benzene	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
1,2,4-trichlorobenzene	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
hexachlorobutadiene	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
1,2,3-trichlorobenzene	mg/kg	0.5	Org-014	<0.5	12	<0.5	<0.5	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-014	106	12	104	104	0	[NT]	108
Surrogate aaa-Trifluorotoluene	%		Org-014	89	12	92	91	1	[NT]	89
Surrogate Toluene-d_8	%		Org-014	100	12	99	100	1	[NT]	99
Surrogate 4-Bromofluorobenzene	%		Org-014	94	12	94	96	2	[NT]	97

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	16416-16
Date extracted	-			01/04/2019	12	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			02/04/2019	12	02/04/2019	02/04/2019		02/04/2019	02/04/2019
vTRH C_6 - C_9	mg/kg	25	Org-016	<25	12	<25	<25	0	97	96
vTRH C_6 - C_{10}	mg/kg	25	Org-016	<25	12	<25	<25	0	97	96
Benzene	mg/kg	0.2	Org-016	<0.2	12	<0.2	<0.2	0	95	93
Toluene	mg/kg	0.5	Org-016	<0.5	12	<0.5	<0.5	0	99	98
Ethylbenzene	mg/kg	1	Org-016	<1	12	<1	<1	0	97	95
m+p-xylene	mg/kg	2	Org-016	<2	12	<2	<2	0	97	96
o-Xylene	mg/kg	1	Org-016	<1	12	<1	<1	0	94	93
Naphthalene	mg/kg	1	Org-014	<1	12	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	99	12	101	101	0	103	98

QUALITY CONTROL: TRH Soil C10-C40 NEPM						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	16416-8
Date extracted	-			01/04/2019	34	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			01/04/2019	34	02/04/2019	02/04/2019		01/04/2019	02/04/2019
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	34	<50	<50	0	101	96
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	34	190	<100	62	102	105
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	34	330	140	81	107	99
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	34	<50	<50	0	101	96
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	34	410	130	104	102	105
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	34	290	150	64	107	99
Surrogate o-Terphenyl	%		Org-003	86	34	82	79	4	84	80

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			01/04/2019	34	01/04/2019	01/04/2019		01/04/2019	[NT]
Date analysed	-			04/04/2019	34	04/04/2019	04/04/2019		04/04/2019	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	94	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	34	1.2	<1	18	94	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	98	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	34	5.0	<1	133	100	[NT]
Anthracene	mg/kg	0.1	Org-012	<0.1	34	1.6	<1	46	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	34	11	2.8	119	98	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	34	11	3.0	114	98	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	34	5.7	2.0	96	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	34	5.9	2.0	99	102	[NT]
Benzo(b,j&k)fluoranthene	mg/kg	0.2	Org-012	<0.2	34	12	5.1	81	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	34	6.9	2.9	82	98	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	34	4.4	2.1	71	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	34	5.6	2.7	70	[NT]	[NT]
Surrogate p-Terphenyl-d_{14}	%		Org-012	96	34	90	90	0	96	[NT]

QUALITY CONTROL: Speciated Phenols in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-		Org-012	01/04/2019	34	01/04/2019	01/04/2019		01/04/2019	[NT]
Date analysed	-		Org-012	04/04/2019	34	04/04/2019	04/04/2019		04/04/2019	[NT]
Phenol	mg/kg	0.2	Org-012	<0.2	34	<2	<2	0	106	[NT]
2-Chlorophenol	mg/kg	0.2	Org-012	<0.2	34	<2	<2	0	114	[NT]
2-Methylphenol	mg/kg	0.2	Org-012	<0.2	34	<2	<2	0	104	[NT]
3/4-Methylphenol	mg/kg	0.4	Org-012	<0.4	34	<4	<4	0	[NT]	[NT]
2-Nitrophenol	mg/kg	0.2	Org-012	<0.2	34	<2	<2	0	[NT]	[NT]
2,4-Dimethylphenol	mg/kg	0.2	Org-012	<0.2	34	<2	<2	0	[NT]	[NT]
2,4-Dichlorophenol	mg/kg	0.2	Org-012	<0.2	34	<2	<2	0	[NT]	[NT]
2,6-Dichlorophenol	mg/kg	0.2	Org-012	<0.2	34	<2	<2	0	94	[NT]
2,4,5-Trichlorophenol	mg/kg	0.2	Org-012	<0.2	34	<2	<2	0	[NT]	[NT]
2,4,6-Trichlorophenol	mg/kg	0.2	Org-012	<0.2	34	<2	<2	0	[NT]	[NT]
2,4-Dinitrophenol	mg/kg	2	Org-012	<2	34	<20	<20	0	[NT]	[NT]
4-Nitrophenol	mg/kg	4	Org-012	<4	34	<40	<40	0	[NT]	[NT]
2,3,4,6-Tetrachlorophenol	mg/kg	0.2	Org-012	<0.2	34	<2	<2	0	[NT]	[NT]
Pentachlorophenol	mg/kg	1	Org-012	<1	34	<10	<10	0	94	[NT]
4-Chloro-3-Methylphenol	mg/kg	2	Org-012	<2	34	<20	<20	0	[NT]	[NT]
Surrogate Phenol-d_6	%		Org-012	110	34	100	106	6	114	[NT]

QUALITY CONTROL: OCP in Soil - NEPM						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			01/04/2019	34	01/04/2019	01/04/2019		01/04/2019	[NT]
Date analysed	-			04/04/2019	34	04/04/2019	04/04/2019		04/04/2019	[NT]
alpha-BHC	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	98	[NT]
Hexachlorobenzene	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	112	[NT]
gamma-BHC	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	122	[NT]
delta-BHC	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	100	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	90	[NT]
gamma-Chlordane	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	102	[NT]
alpha-chlordane	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	100	[NT]
Dieldrin	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	96	[NT]
Endrin	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	100	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	116	[NT]
Methoxychlor	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	[NT]	[NT]
Mirex	mg/kg	0.5	Org-012	<0.5	34	<5	<5	0	[NT]	[NT]
Surrogate p-Terphenyl-d_{14}	%		Org-012	96	34	90	90	0	96	[NT]

QUALITY CONTROL: OP in Soil - NEPM						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			01/04/2019	34	01/04/2019	01/04/2019		01/04/2019	[NT]
Date analysed	-			04/04/2019	34	04/04/2019	04/04/2019		04/04/2019	[NT]
Chlorpyrifos	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	100	[NT]
Surrogate p-Terphenyl-d_{14}	%		Org-012	96	34	90	90	0	96	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			01/04/2019	34	01/04/2019	01/04/2019		01/04/2019	[NT]
Date analysed	-			04/04/2019	34	04/04/2019	04/04/2019		04/04/2019	[NT]
Aroclor 1016	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	85	[NT]
Aroclor 1260	mg/kg	0.1	Org-012	<0.1	34	<1	<1	0	[NT]	[NT]
Surrogate p-Terphenyl-d_{14}	%		Org-012	96	34	90	90	0	96	[NT]

QUALITY CONTROL: Synthetic Pyrethroids - NEPM						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			01/04/2019	34	01/04/2019	01/04/2019		01/04/2019	[NT]
Date analysed	-			04/04/2019	34	04/04/2019	04/04/2019		04/04/2019	[NT]
Bifenthrin	mg/kg	0.5	Org-012	<0.5	34	<5	<5	0	100	[NT]

QUALITY CONTROL: Triazine Herbicides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			01/04/2019	34	01/04/2019	01/04/2019		01/04/2019	[NT]
Date analysed	-			04/04/2019	34	04/04/2019	04/04/2019		04/04/2019	[NT]
Atrazine	mg/kg	0.5	Org-012	<0.5	34	<5	<5	0	74	[NT]

QUALITY CONTROL: Phenoxy Acid Herbicides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Clopyralid	mg/kg	0.5	ORG-031	<0.5	34	<0.5	<0.5	0	114	[NT]
3,5-Dichlorobenzoic acid	mg/kg	0.5	ORG-031	<0.5	34	<0.5	<0.5	0	[NT]	[NT]
o-Chlorophenoxy acetic acid	mg/kg	0.5	ORG-031	<0.5	34	<0.5	<0.5	0	[NT]	[NT]
4-CPA	mg/kg	0.5	ORG-031	<0.5	34	<0.5	<0.5	0	[NT]	[NT]
Dicamba	mg/kg	0.5	ORG-031	<0.5	34	<0.5	<0.5	0	[NT]	[NT]
Mecoprop	mg/kg	0.5	ORG-031	<0.5	34	<0.5	<0.5	0	[NT]	[NT]
MCPA	mg/kg	0.5	ORG-031	<0.5	34	<0.5	<0.5	0	[NT]	[NT]
Dichloroprop	mg/kg	0.5	ORG-031	<0.5	34	<0.5	<0.5	0	[NT]	[NT]
2,4-D	mg/kg	0.5	ORG-031	<0.5	34	<0.5	<0.5	0	90	[NT]
Bromoxynil	mg/kg	0.5	ORG-031	<0.5	34	<0.5	<0.5	0	[NT]	[NT]
Triclopyr	mg/kg	0.5	ORG-031	<0.5	34	<0.5	<0.5	0	[NT]	[NT]
2,4,5-TP (Silvex)	mg/kg	0.5	ORG-031	<0.5	34	<0.5	<0.5	0	[NT]	[NT]
2,4,5-T	mg/kg	0.5	ORG-031	<0.5	34	<0.5	<0.5	0	94	[NT]
MCPB	mg/kg	0.5	ORG-031	<0.5	34	<0.5	<0.5	0	[NT]	[NT]
Dinoseb	mg/kg	1	ORG-031	<1	34	<1	<1	0	[NT]	[NT]
2.4-DB	mg/kg	0.5	ORG-031	<0.5	34	<0.5	<0.5	0	[NT]	[NT]
Ioxynil	mg/kg	1	ORG-031	<1	34	<1	<1	0	[NT]	[NT]
Picloram	mg/kg	0.5	ORG-031	<0.5	34	<0.5	<0.5	0	[NT]	[NT]
DCPA (Chlorthal) Diacid	mg/kg	0.5	ORG-031	<0.5	34	<0.5	<0.5	0	[NT]	[NT]
Acifluorfen	mg/kg	2	ORG-031	<2	34	<2	<2	0	[NT]	[NT]
2,4,6-T	mg/kg	0.5	ORG-031	<0.5	34	<0.5	<0.5	0	[NT]	[NT]
2,6-D	mg/kg	0.5	ORG-031	<0.5	34	<0.5	<0.5	0	[NT]	[NT]
Surrogate: 2,4-DCPA	%		ORG-031	98	34	96	84	13	102	[NT]

QUALITY CONTROL: NEPM screen metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	16416-22
Date digested	-			01/04/2019	12	01/04/2019	01/04/2019		01/04/2019	01/04/2019
Date analysed	-			02/04/2019	12	02/04/2019	02/04/2019		02/04/2019	02/04/2019
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	12	8	8	0	98	114
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	12	0.9	0.7	25	100	92
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	12	8	8	0	98	104
Copper	mg/kg	1	Metals-020 ICP-AES	<1	12	29	24	19	97	115
Lead	mg/kg	1	Metals-020 ICP-AES	<1	12	360	300	18	96	102
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	12	<0.1	<0.1	0	109	113
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	12	9	15	50	96	93
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	12	230	170	30	98	118
Beryllium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	103	97
Boron	mg/kg	3	Metals-020 ICP-AES	<3	[NT]	[NT]	[NT]	[NT]	103	125
Cobalt	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	98	93
Manganese	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	101	118
Selenium	mg/kg	2	Metals-020 ICP-AES	<2	[NT]	[NT]	[NT]	[NT]	99	101

QUALITY CONTROL: Misc Inorg - soil NEPM						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			01/04/2019	[NT]	[NT]	[NT]	[NT]	01/04/2019	[NT]
Date analysed	-			03/04/2019	[NT]	[NT]	[NT]	[NT]	03/04/2019	[NT]
Free Cyanide in soil	mg/kg	0.5	Inorg-013	<0.5	[NT]	[NT]	[NT]	[NT]	100	[NT]
Hexavalent Chromium, Cr^{6+}	mg/kg	1	Inorg-024	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			02/04/2019	[NT]	[NT]	[NT]	[NT]	02/04/2019	[NT]
Date analysed	-			02/04/2019	[NT]	[NT]	[NT]	[NT]	02/04/2019	[NT]
TRH C_6 - C_9	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	101	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	101	[NT]
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	100	[NT]
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Surrogate Dibromofluoromethane	%		Org-016	100	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate toluene-d8	%		Org-016	100	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate 4-BFB	%		Org-016	100	[NT]	[NT]	[NT]	[NT]	100	[NT]

QUALITY CONTROL: Metals in Waters - Total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			01/04/2019	[NT]	[NT]	[NT]	[NT]	01/04/2019	[NT]
Date analysed	-			01/04/2019	[NT]	[NT]	[NT]	[NT]	01/04/2019	[NT]
Arsenic - Total	mg/L	0.05	Metals-020 ICP-AES	<0.05	[NT]	[NT]	[NT]	[NT]	99	[NT]
Barium - Total	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	[NT]	[NT]	103	[NT]
Beryllium - Total	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	[NT]	[NT]	98	[NT]
Boron - Total	mg/L	0.2	Metals-020 ICP-AES	<0.2	[NT]	[NT]	[NT]	[NT]	107	[NT]
Cadmium - Total	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	[NT]	[NT]	100	[NT]
Chromium - Total	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	[NT]	[NT]	100	[NT]
Cobalt - Total	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	[NT]	[NT]	103	[NT]
Copper - Total	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	[NT]	[NT]	101	[NT]
Lead - Total	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	[NT]	[NT]	98	[NT]
Manganese - Total	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	[NT]	[NT]	102	[NT]
Mercury-Total	µg/L	0.05	Metals-021 CV-AAS	<0.05	[NT]	[NT]	[NT]	[NT]	106	[NT]
Nickel - Total	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	[NT]	[NT]	99	[NT]
Zinc - Total	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	[NT]	[NT]	100	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Report Comments

METALS: Laboratory %RPD acceptance criteria exceeded for laboratory sample number 16416-12 for Nickel, reanalysis indicates possible sample heterogeneity. Therefore triplicate issued as laboratory sample number 16416-45.

SVOC & TRH: Laboratory %RPD acceptance criteria exceeded for laboratory sample number 16416-34 for PAHs and TRH, reanalysis indicates possible sample heterogeneity. Therefore triplicate issued as laboratory sample number 16416-46.

PQL has been raised due to the high concentration of analytes in the sample/s, resulting in the sample/s requiring dilution.

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DATA QUALITY ASSESSMENT SUMMARY

Report Details

Envirolab Report Reference	**16416**
Client ID	Environmental Projects
Project Reference	19032.01 Medindie Soil Sampling
Date Issued	05/04/2019

QC DATA

All laboratory QC data was within the Envirolab Group's specifications except:

QC Specification Exceptions

QC Type	Reference	Analysis	Comments
Precision (as %RPD)	16416-12	Nickel	50% RPD fails internal acceptance criteria
Precision (as %RPD)	16416-34	Benzo(a)anthracene	96% RPD fails internal acceptance criteria
Precision (as %RPD)	16416-34	Benzo(a)pyrene	82% RPD fails internal acceptance criteria
Precision (as %RPD)	16416-34	Benzo(a)pyrene TEQ calc (Half)	77% RPD fails internal acceptance criteria
Precision (as %RPD)	16416-34	Benzo(a)pyrene TEQ calc (PQL)	70% RPD fails internal acceptance criteria
Precision (as %RPD)	16416-34	Benzo(a)pyrene TEQ calc (Zero)	83% RPD fails internal acceptance criteria
Precision (as %RPD)	16416-34	Benzo(b,j&k)fluoranthene	81% RPD fails internal acceptance criteria
Precision (as %RPD)	16416-34	Benzo(g,h,i)perylene	70% RPD fails internal acceptance criteria
Precision (as %RPD)	16416-34	Chrysene	99% RPD fails internal acceptance criteria
Precision (as %RPD)	16416-34	Fluoranthene	119% RPD fails internal acceptance criteria
Precision (as %RPD)	16416-34	Indeno(1,2,3-c,d)pyrene	71% RPD fails internal acceptance criteria
Precision (as %RPD)	16416-34	Pyrene	114% RPD fails internal acceptance criteria
Precision (as %RPD)	16416-34	Total +ve TRH (>C10-C40)	83% RPD fails internal acceptance criteria
Precision (as %RPD)	16416-34	Total +ve TRH (C10-C36)	115% RPD fails internal acceptance criteria
Precision (as %RPD)	16416-34	Total +vePAH's	101% RPD fails internal acceptance criteria

QC Comments

METALS: Laboratory %RPD acceptance criteria exceeded for laboratory sample number 16416-12 for Nickel, reanalysis indicates possible sample heterogeneity. Therefore triplicate issued as laboratory sample number 16416-45.

SVOC & TRH: Laboratory %RPD acceptance criteria exceeded for laboratory sample number 16416-34 for PAHs and TRH, reanalysis indicates possible sample heterogeneity. Therefore triplicate issued as laboratory sample number 16416-46.

PQL has been raised due to the high concentration of analytes in the sample/s, resulting in the sample/s requiring dilution.

See Report 16416-[R00] for QA/QC details

HOLDING TIME COMPLIANCE EVALUATION

All preservation / holding times (based on AS/ASPHA/ISO/NEPM/USEPA reference documents and standards) are compliant.

Certain analyses have had their recommended technical holding times elongated by filtering and/or freezing on receipt at the laboratory (e.g. BOD, chlorophyll/Pheophytin, nutrients and acid sulphate soil tests).

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COMPLIANCE TO QC FREQUENCY (NEPM)

Internal laboratory QC rate complies with NEPM requirements (LCS/MB/MS 1 in 20, Duplicates 1 in 10 samples). Note, samples are batched together with other sample consignments in order to assign QC sample frequency.

QC Evaluation	
Duplicate(s) was performed as per NEPM frequency	✓
Laboratory Control Sample(s) were analysed with the samples received	✓
A Method Blank was performed with the samples received	✓
Matrix spike(s) was performed as per NEPM frequency	✓

Refer to Certificate of Analysis for all Quality Control data.

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SAMPLE RECEIPT ADVICE

Client Details

Client	Environmental Projects
Attention	Brad Fitzgerald

Sample Login Details

Your reference	19032.01 Medindie Soil Sampling
Envirolab Reference	16416
Date Sample Received	29/03/2019
Date Instructions Received	29/03/2019
Date Results Expected to be Reported	05/04/2019

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	2 Water, 42 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	12.1
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Pamela Adams	Analisa Mathrick
Phone: 03 9763 2500	**Phone: 03 9763 2500**
Fax: 03 9763 2633	**Fax: 03 9763 2633**
Email: padams@envirolab.com.au	**Email: amathrick@envirolab.com.au**

Analysis Underway, details on the following page:

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Sample ID	VOCs in soil	vTRH(C6-C10)/BTEXN in Soil	TRH Soil C10-C40 NEPM	PAHs in Soil	Speciated Phenols in Soil	OCP in Soil - NEPM	OP in Soil - NEPM	PCBsin Soil	Synthetic Pyrethroids - NEPM	Triazine Herbicides in Soil	Phenoxy Acid Herbicidesin Soil	NEPM screen metals in soil	Free Cyanide in soil	Hexavalent Chromium, Cr6+	vTRH(C6-C10)/BTEXN in Water	Metals in Waters -Total	On Hold
TB															✓		
EB																✓	
SB1-1-0.0-0.1																	✓
SB1-2-0.1-0.2																	✓
SB1-3-0.2-0.3																	✓
SB1-4-0.55-0.65																	✓
SB1-5-0.9-1.0																	✓
SB2-1-0.0-0.1		✓	✓									✓					
SB2-2-0.2-0.3																	✓
SB2-3-0.45-0.55																	✓
SB2-4-0.9-1.0																	✓
SB3-1-0.1-0.2	✓	✓	✓	✓								✓					
SB3-2-0.2-0.3																	✓
SB3-3-0.5-0.6																	✓
SB3-4-0.9-1.0																	✓
SB4-1-0.3-0.35	✓	✓	✓									✓					
SB4-2-0.35-0.45																	✓
SB4-3-0.6-0.7																	✓
SB4-4-0.9-1.0																	✓
SB5-1-0.0-0.1																	✓
SB5-2-0.1-0.2																	✓
SB5-3-0.2-0.3	✓	✓	✓	✓								✓					
SB5-4-0.6-0.7																	✓
SB5-5-0.9-1.0																	✓
SB6-1 -0.0-0.																	✓
SB6-2-0.15-0.25		✓	✓									✓					
SB6-3-0.55-0.65																	✓
SB6-4-0.9-1.0																	✓
SB7-1-0.0-0.1	✓	✓	✓									✓					
SB7-2-0.15-0.25		✓	✓	✓								✓					
SB7-3-0.4-0.5																	✓
SB7-4-0.8-0.9																	✓

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Sample ID	VOCs in soil	vTRH(C6-C10)/BTEXN in Soil	TRH Soil C10-C40 NEPM	PAHs in Soil	Speciated Phenols in Soil	OCP in Soil - NEPM	OP in Soil - NEPM	PCBsin Soil	Synthetic Pyrethroids - NEPM	Triazine Herbicides in Soil	Phenoxy Acid Herbicidesin Soil	NEPM screen metals in soil	Free Cyanide in soil	Hexavalent Chromium, Cr6+	vTRH(C6-C10)/BTEXN in Water	Metals in Waters -Total	On Hold
SB8-1-0.0-0.1																	✓
SB8-2-0.2-0.3		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
SB8-3-0.3-0.4																	✓
SB8-4-0.7-0.8																	✓
SB8-5-0.9-1.0																	✓
Dup-1																	✓
Dup-2																	✓
Dup-3																	✓
Dup-4																	✓
Dup-5																	✓
Dup-7		✓	✓									✓					
Dup-8																	✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

CHAIN OF CUSTODY DOCUMENTATION - Environmental Projects

Project Title :	Medindie Soil Sampling		
Job Number :	19032.01		
Project Manager:	Brad Fitzgerald		
Phone:	0422 482 364	**Primary Laboratory:**	Envirolab
Email:	brad.fitzgerald@environmentalprojects.com.au	**Laboratory Quote Ref:**	
Results to:	Lab.Results@environmentalprojects.com.au brad.fitzgerald@environmentalprojects.com.au	**Secondary Laboratory:**	ALS
Invoice to:	Lab.Results@environmentalprojects.com.au brad.fitzgerald@environmentalprojects.com.au	**Laboratory Quote Ref:**	

COC REFERENCE	Turnaround Required
19032.01 COC-1	Standard

SAMPLE DETAILS					CHEMICAL TESTING REQUIRED										
Contract Laboratory Sample ID	Sample ID	Sample Depth	Date Sampled	Sample Matrix	Metals (13)	TRH (C6-C10)	TRH + BTEX + Metals (8)	TRH + BTEX + PAHs + Metals (8)	VOCs	NEPM Screen					Additional Comments / Notes
1	TB	-	28/03/2019	Water		1									
2	EB	-	28/03/2019	Water	1										
3	SB1-1	0.0-0.1	28/03/2019	Soil				1	1						
4	SB1-2	0.1-0.2	28/03/2019	Soil											
5	SB1-3	0.2-0.3	28/03/2019	Soil											
6	SB1-4	0.55-0.65	28/03/2019	Soil											
7	SB1-5	0.9-1.0	28/03/2019	Soil											
8	SB2-1	0.0-0.1	28/03/2019	Soil			1								
9	SB2-2	0.2-0.3	28/03/2019	Soil											
10	SB2-3	0.45-0.55	28/03/2019	Soil											
11	SB2-4	0.9-1.0	28/03/2019	Soil											
12	SB3-1	0.1-0.2	28/03/2019	Soil				1	1						
13	SB3-2	0.2-0.3	28/03/2019	Soil											
14	SB3-3	0.5-0.6	28/03/2019	Soil											
15	SB3-4	0.9-1.0	28/03/2019	Soil											
16	SB4-1	0.3-0.35	28/03/2019	Soil			1		1						
17	SB4-2	0.35-0.45	28/03/2019	Soil											
18	SB4-3	0.6-0.7	28/03/2019	Soil											
19	SB4-4	0.9-1.0	28/03/2019	Soil											
20	SB5-1	0.0-0.1	28/03/2019	Soil											
21	SB5-2	0.1-0.2	28/03/2019	Soil											
22	SB5-3	0.2-0.3	28/03/2019	Soil				1							
23	SB5-4	0.6-0.7	28/03/2019	Soil											
24	SB5-5	0.9-1.0	28/03/2019	Soil											
EP AUTHORISATION			**LABORATORY RECEIPT**		1	1	2	3	3	0					
Requested by:			Received by:		**Additional Comments**										
Date/time requested:			Date/time received:												
Signature:			Signature:												

ENVIROLAB GROUP

Envirolab Services
25 Research Drive
Croydon South VIC 3136
Ph: (03) 9763 2500

Job No: 16416

Date Received: 29/3/19
Time Received: 9.10
Received By: GS
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

CHAIN OF CUSTODY DOCUMENTATION - **Environmental Projects**

Project Title :	Medindie Soil Sampling		
Job Number :	19032.01		
Project Manager:	Brad Fitzgerald		
Phone:	0422 482 364	**Primary Laboratory:**	Envirolab
Email:	brad.fitzgerald@environmentalprojects.com.au	**Laboratory Quote Ref:**	
Results to:	Lab.Results@environmentalprojects.com.au brad.fitzgerald@environmentalprojects.com.au	**Secondary Laboratory:**	ALS
Invoice to:	Lab.Results@environmentalprojects.com.au brad.fitzgerald@environmentalprojects.com.au	**Laboratory Quote Ref:**	

COC REFERENCE	Turnaround Required
19032.01 COC-1	Standard

SAMPLE DETAILS					CHEMICAL TESTING REQUIRED										
Contract Laboratory Sample ID	Sample ID	Sample Depth	Date Sampled	Sample Matrix	Metals (13)	TRH (C6-C10)	TRH + BTEX + Metals (8)	TRH + BTEX + PAHs + Metals (8)	VOCs	NEPM Screen					Additional Comments / Notes
25	SB6-1	0.0-0.1	28/03/2019	Soil											
26	SB6-2	0.15-0.25	28/03/2019	Soil			1								
27	SB6-3	0.55-0.65	28/03/2019	Soil											
28	SB6-4	0.9-1.0	28/03/2019	Soil											
29	SB7-1	0.0-0.1	28/03/2019	Soil			1		1						
30	SB7-2	0.15-0.25	28/03/2019	Soil				1							
31	SB7-3	0.4-0.5	28/03/2019	Soil											
32	SB7-4	0.8-0.9	28/03/2019	Soil											
33	SB8-1	0.0-0.1	28/03/2019	Soil											
34	SB8-2	0.2-0.3	28/03/2019	Soil						1					
35	SB8-3	0.3-0.4	28/03/2019	Soil											
36	SB8-4	0.7-0.8	28/03/2019	Soil											
37	SB8-5	0.9-1.0	28/03/2019	Soil											
38	Dup-1	-	28/03/2019	Soil											
39	Dup-2	-	28/03/2019	Soil											
40	Dup-3	-	28/03/2019	Soil											
41	Dup-4	-	28/03/2019	Soil											
42	Dup-5	-	28/03/2019	Soil											
*	Dup-6	-	28/03/2019	Soil			1	SEND TO ALS FOR TRH + BTEX + Metals (8) ANALYSIS							
43	Dup-7	-	28/03/2019	Soil			1								
44	Dup-8	-	28/03/2019	Soil											
LABORATORY RECEIPT					0	0	4	1	1	1					

EP AUTHORISATION	
Requested by:	Received by:
Date\time requested:	Date\time received:
Signature:	Signature:

Additional Comments

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CERTIFICATE OF ANALYSIS 16416-B

Client Details

Client	Environmental Projects
Attention	Brad Fitzgerald
Address	Level 3, 117 King William St, Adelaide, SA, 5000

Sample Details

Your Reference	**19032.01 Medindie Soil Sampling**
Number of Samples	2 Water, 42 Soil
Date samples received	29/03/2019
Date completed instructions received	22/05/2019

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	28/05/2019
Date of Issue	27/05/2019

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Results Approved By
Pamela Adams, Laboratory Manager, Melbourne

Authorised By

Pamela Adams, Laboratory Manager

Metals in ASLP			
Our Reference		16416-B-3	16416-B-30
Your Reference	UNITS	SB1-1	SB7-2
Depth		0.0-0.1	0.15-0.25
Date Sampled		28/03/2019	28/03/2019
Type of sample		Soil	Soil
Date extracted	-	23/05/2019	23/05/2019
Date analysed	-	24/05/2019	24/05/2019
pH of soil for ASLP	pH units	9.4	9.2
pH of soil ASLP (after HCl)	pH units	2.1	4.3
Extraction fluid used	-	1	1
pH of final Leachate	pH units	6.2	6.1
Arsenic in ASLP	mg/L	[NA]	0.2
Copper in ASLP	mg/L	0.2	[NA]
Lead in ASLP	mg/L	[NA]	0.5
Zinc in ASLP	mg/L	0.5	[NA]

Method ID	Methodology Summary
EXTRACT.7	Toxicity Characteristic Leaching Procedure (TCLP).
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only as analysis outside of the APHA storage times.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439 and USEPA 1311. Please note that the sample mass used may be scaled down from the default based on the sample mass available. Samples are stored at 2-6oC before and after leachate preparation.
Metals-020 ASLP	Determination of various metals by ICP-MS following leaching using neutralised deionised water by AS 4439.3 - 1997.

QUALITY CONTROL: Metals in ASLP					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			23/05/2019	[NT]	[NT]	[NT]	[NT]	23/05/2019	[NT]
Date analysed	-			24/05/2019	[NT]	[NT]	[NT]	[NT]	24/05/2019	[NT]
Arsenic in ASLP	mg/L	0.05	Metals-020 ASLP	<0.05	[NT]	[NT]	[NT]	[NT]	107	[NT]
Copper in ASLP	mg/L	0.01	Metals-020 ASLP	<0.01	[NT]	[NT]	[NT]	[NT]	100	[NT]
Lead in ASLP	mg/L	0.03	Metals-020 ASLP	<0.03	[NT]	[NT]	[NT]	[NT]	97	[NT]
Zinc in ASLP	mg/L	0.02	Metals-020 ASLP	<0.02	[NT]	[NT]	[NT]	[NT]	104	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

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DATA QUALITY ASSESSMENT SUMMARY

Report Details

Envirolab Report Reference	**16416-B**
Client ID	Environmental Projects
Project Reference	19032.01 Medindie Soil Sampling
Date Issued	27/05/2019

QC DATA

All laboratory QC data was within the Envirolab Group's specifications.

HOLDING TIME COMPLIANCE EVALUATION

All preservation / holding times (based on AS/ASPHA/ISO/NEPM/USEPA reference documents and standards) are compliant.

Certain analyses have had their recommended technical holding times elongated by filtering and/or freezing on receipt at the laboratory (e.g. BOD, chlorophyll/Pheophytin, nutrients and acid sulphate soil tests).

COMPLIANCE TO QC FREQUENCY (NEPM)

Internal laboratory QC rate complies with NEPM requirements (LCS/MB/MS 1 in 20, Duplicates 1 in 10 samples). Note, samples are batched together with other sample consignments in order to assign QC sample frequency.

QC Evaluation

Duplicate(s) was performed as per NEPM frequency	✓
Laboratory Control Sample(s) were analysed with the samples received	✓
A Method Blank was performed with the samples received	✓
Matrix spike(s) was performed as per NEPM frequency	✓

Refer to Certificate of Analysis for all Quality Control data.

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SAMPLE RECEIPT ADVICE

Client Details

Client	Environmental Projects
Attention	Brad Fitzgerald

Sample Login Details

Your reference	19032.01 Medindie Soil Sampling
Envirolab Reference	16416-B
Date Sample Received	29/03/2019
Date Instructions Received	22/05/2019
Date Results Expected to be Reported	29/05/2019

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	2 Water, 42 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	12.1
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Pamela Adams	Analisa Mathrick
Phone: 03 9763 2500	**Phone: 03 9763 2500**
Fax: 03 9763 2633	**Fax: 03 9763 2633**
Email: padams@envirolab.com.au	**Email: amathrick@envirolab.com.au**

Analysis Underway, details on the following page:

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Sample ID	Metals in ASLP	On Hold
TB		✓
EB		✓
SB1-1-0.0-0.1	✓	
SB1-2-0.1-0.2		✓
SB1-3-0.2-0.3		✓
SB1-4-0.55-0.65		✓
SB1-5-0.9-1.0		✓
SB2-1-0.0-0.1		✓
SB2-2-0.2-0.3		✓
SB2-3-0.45-0.55		✓
SB2-4-0.9-1.0		✓
SB3-1-0.1-0.2		✓
SB3-2-0.2-0.3		✓
SB3-3-0.5-0.6		✓
SB3-4-0.9-1.0		✓
SB4-1-0.3-0.35		✓
SB4-2-0.35-0.45		✓
SB4-3-0.6-0.7		✓
SB4-4-0.9-1.0		✓
SB5-1-0.0-0.1		✓
SB5-2-0.1-0.2		✓
SB5-3-0.2-0.3		✓
SB5-4-0.6-0.7		✓
SB5-5-0.9-1.0		✓
SB6-1 -0.0-0.1		✓
SB6-2-0.15-0.25		✓
SB6-3-0.55-0.65		✓
SB6-4-0.9-1.0		✓
SB7-1-0.0-0.1		✓
SB7-2-0.15-0.25	✓	
SB7-3-0.4-0.5		✓
SB7-4-0.8-0.9		✓

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Sample ID	Metals in ASLP	On Hold
SB8-1-0.0-0.1		✓
SB8-2-0.2-0.3		✓
SB8-3-0.3-0.4		✓
SB8-4-0.7-0.8		✓
SB8-5-0.9-1.0		✓
Dup-1		✓
Dup-2		✓
Dup-3		✓
Dup-4		✓
Dup-5		✓
Dup-7		✓
Dup-8		✓
SB3-1 - Triplicate-0.1-0.2		✓
SB8-2 - Triplicate-0.2-0.3		✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.

16416-B

Pamela Adams

Subject: FW: Hold times for 16416

From: Brad.Fitzgerald <Brad.Fitzgerald@environmentalprojects.com.au>
Sent: Wednesday, 22 May 2019 4:39 PM
To: Alex Stenta <astenta@envirolab.com.au>
Subject: RE: Hold times for 16416

Dear Alex,

Hope you are well? I'm plugging along and I'm still coming to terms with the final ever episode of Game of Thrones. I found myself happy, excited, sad, confused – basically just an emotional mess.

Anyways could I please have the following testing arranged for samples on hold at your laboratory, relating to report 16416:

- Sample SB8-2 for MEP of BaP (just within the 60 days) [redacted]
- Sample SB7-2 for ASLP of arsenic & lead -30
- Sample SB1-1 for ASLP of copper and zinc -3

Regards,
Brad Fitzgerald
0422 482 364

From: Alex Stenta <astenta@envirolab.com.au>
Sent: Friday, 3 May 2019 10:25 AM
To: Brad.Fitzgerald <Brad.Fitzgerald@environmentalprojects.com.au>
Subject: RE: Hold times for 16416

HI Brad,

You're holding times for metals are fine.

The recommended holding time for B(a)P is 14 days but as we've spoken about previously, there is evidence that heavier PAH's are stable for up to 60 days if stored cold or frozen.

Let me know if you need any more info.

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CERTIFICATE OF ANALYSIS 16416-C

Client Details

Client	Environmental Projects
Attention	Brad Fitzgerald
Address	Level 3, 117 King William St, Adelaide, SA, 5000

Sample Details

Your Reference	**19032.01 Medindie Soil Sampling**
Number of Samples	10 Soil
Date samples received	29/03/2019
Date completed instructions received	22/05/2019

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	17/06/2019
Date of Issue	14/06/2019

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Chris De Luca, Operations Manager

Authorised By

Pamela Adams, Laboratory Manager

PAHs in ASLP 4439.2 and 4439.3						
Our Reference		16416-C-1	16416-C-2	16416-C-3	16416-C-4	16416-C-5
Your Reference	UNITS	SB8-2-EP	SB8-2-MEP1	SB8-2-MEP2	SB8-2-MEP3	SB8-2-MEP4
Depth		0.2-0.3	-	-	-	-
Date Sampled		28/03/2019	28/03/2019	28/03/2019	28/03/2019	28/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/05/2019	29/05/2019	29/05/2019	31/05/2019	31/05/2019
Date analysed	-	03/06/2019	03/06/2019	03/06/2019	05/06/2019	05/06/2019
pH of soil for ASLP	pH units	9.4	5.6	4.8	4.6	4.6
pH of final Leachate	pH units	5.0	6.4	6.0	6.1	6.0
Naphthalene in ASLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthylene in ASLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthene in ASLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Fluorene in ASLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Phenanthrene in ASLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Anthracene in ASLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Fluoranthene in ASLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Pyrene in ASLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(a)anthracene in ASLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Chrysene in ASLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(bjk)fluoranthene in ASLP	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002
Benzo(a)pyrene in ASLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Indeno(1,2,3-c,d)pyrene - ASLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Dibenzo(a,h)anthracene in ASLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(g,h,i)perylene in ASLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Surrogate p-Terphenyl-d_{14}	%	92	82	90	84	92

PAHs in ASLP 4439.2 and 4439.3						
Our Reference		16416-C-6	16416-C-7	16416-C-8	16416-C-9	16416-C-10
Your Reference	UNITS	SB8-2-MEP5	SB8-2-MEP6	SB8-2-MEP7	SB8-2-MEP8	SB8-2-MEP9
Depth		-	-	-	-	-
Date Sampled		28/03/2019	28/03/2019	28/03/2019	28/03/2019	28/03/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	06/06/2019	06/06/2019	12/06/2019	12/06/2019	12/06/2019
Date analysed	-	09/06/2019	09/06/2019	13/06/2019	13/06/2019	13/06/2019
pH of soil for ASLP	pH units	4.5	3.9	3.7	3.4	3.2
pH of final Leachate	pH units	5.7	5.3	4.8	4.3	4.2
Naphthalene in ASLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthylene in ASLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthene in ASLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Fluorene in ASLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Phenanthrene in ASLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Anthracene in ASLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Fluoranthene in ASLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Pyrene in ASLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(a)anthracene in ASLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Chrysene in ASLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(bjk)fluoranthene in ASLP	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002
Benzo(a)pyrene in ASLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Indeno(1,2,3-c,d)pyrene - ASLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Dibenzo(a,h)anthracene in ASLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(g,h,i)perylene in ASLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Surrogate p-Terphenyl-d_{14}	%	96	92	84	86	96

Method ID	Methodology Summary
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only as analysis outside of the APHA storage times.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439 and USEPA 1311. Please note that the sample mass used may be scaled down from the default based on the sample mass available. Samples are stored at 2-6oC before and after leachate preparation.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-012	Leachates are extracted with Dichloromethane and analysed by GC-MS.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater 2013.

QUALITY CONTROL: PAHs in ASLP 4439.2 and 4439.3					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			29/05/2019	[NT]	[NT]	[NT]	[NT]	29/05/2019	[NT]
Date analysed	-			03/06/2019	[NT]	[NT]	[NT]	[NT]	03/06/2019	[NT]
Naphthalene in ASLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	66	[NT]
Acenaphthylene in ASLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	80	[NT]
Acenaphthene in ASLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene in ASLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	90	[NT]
Phenanthrene in ASLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	88	[NT]
Anthracene in ASLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene in ASLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	86	[NT]
Pyrene in ASLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	86	[NT]
Benzo(a)anthracene in ASLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene in ASLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	82	[NT]
Benzo(bjk)fluoranthene in ASLP	mg/L	0.002	Org-012	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene in ASLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	78	[NT]
Indeno(1,2,3-c,d)pyrene - ASLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene in ASLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene in ASLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d_{14}	%		Org-012	88	[NT]	[NT]	[NT]	[NT]	90	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Envirolab Services Pty Ltd
ABN 37 112 535 645 - 002
25 Research Drive Croydon South VIC 3136
ph 03 9763 2500 fax 03 9763 2633
melbourne@envirolab.com.au
www.envirolab.com.au

DATA QUALITY ASSESSMENT SUMMARY

Report Details

Envirolab Report Reference	**16416-C**
Client ID	Environmental Projects
Project Reference	19032.01 Medindie Soil Sampling
Date Issued	14/06/2019

QC DATA

All laboratory QC data was within the Envirolab Group's specifications.

HOLDING TIME COMPLIANCE EVALUATION

All preservation / holding times (based on AS/ASPHA/ISO/NEPM/USEPA reference documents and standards) are compliant except:

Holding Time Exceedances

Analysis	Sample No	Date Sampled	Date Extracted	Date Analysed	Accepted
PAHs in ASLP 4439.2 and 4439.3					
	16416-C-1	28/03/2019	29/05/2019	03/06/2019	✗
	16416-C-2	28/03/2019	29/05/2019	03/06/2019	✗
	16416-C-3	28/03/2019	29/05/2019	03/06/2019	✗
	16416-C-4	28/03/2019	31/05/2019	05/06/2019	✗
	16416-C-5	28/03/2019	31/05/2019	05/06/2019	✗
	16416-C-6	28/03/2019	06/06/2019	09/06/2019	✗
	16416-C-7	28/03/2019	06/06/2019	09/06/2019	✗
	16416-C-8	28/03/2019	12/06/2019	13/06/2019	✗
	16416-C-9	28/03/2019	12/06/2019	13/06/2019	✗
	16416-C-10	28/03/2019	12/06/2019	13/06/2019	✗

Certain analyses have had their recommended technical holding times elongated by filtering and/or freezing on receipt at the laboratory (e.g. BOD, chlorophyll/Pheophytin, nutrients and acid sulphate soil tests).

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COMPLIANCE TO QC FREQUENCY (NEPM)

Internal laboratory QC rate complies with NEPM requirements (LCS/MB/MS 1 in 20, Duplicates 1 in 10 samples). Note, samples are batched together with other sample consignments in order to assign QC sample frequency.

QC Evaluation	
Duplicate(s) was performed as per NEPM frequency	✓
Laboratory Control Sample(s) were analysed with the samples received	✓
A Method Blank was performed with the samples received	✓
Matrix spike(s) was performed as per NEPM frequency	✓

Refer to Certificate of Analysis for all Quality Control data.

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SAMPLE RECEIPT ADVICE

Client Details

Client	Environmental Projects
Attention	Brad Fitzgerald

Sample Login Details

Your reference	19032.01 Medindie Soil Sampling
Envirolab Reference	16416-C
Date Sample Received	29/03/2019
Date Instructions Received	22/05/2019
Date Results Expected to be Reported	17/06/2019

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	10 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	12.1
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Pamela Adams	Analisa Mathrick
Phone: 03 9763 2500	**Phone: 03 9763 2500**
Fax: 03 9763 2633	**Fax: 03 9763 2633**
Email: padams@envirolab.com.au	**Email: amathrick@envirolab.com.au**

Analysis Underway, details on the following page:

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Sample ID	PAHs in ASLP 4439.2 and 4439.3
SB8-2-EP-0.2-0.3	✓
SB8-2-EP1	✓
SB8-2-EP2	✓
SB8-2-EP3	✓
SB8-2-EP4	✓
SB8-2-EP5	✓
SB8-2-EP6	✓
SB8-2-EP7	✓
SB8-2-EP8	✓
SB8-2-EP9	✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1904596**	Page	: 1 of 5
Client	: **ENVIRONMENTAL PROJECTS**	Laboratory	: Environmental Division Melbourne
Contact	: BRAD FITZGERALD	Contact	: Customer Services EM
Address	: LEVEL 3 117 KING WILLIAM ST ADELAIDE SA 5001	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: +61 08 8410 1846	Telephone	: +61-3-8549 9600
Project	: 19032.01	Date Samples Received	: 29-Mar-2019 13:00
Order number	:	Date Analysis Commenced	: 02-Apr-2019
C-O-C number	: ----	Issue Date	: 04-Apr-2019 12:41
Sampler	: ----		
Site	: ----		
Quote number	: EN/333		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	Dup-6	----	----	----	----
				Client sampling date / time	28-Mar-2019 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM1904596-001	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content									
Moisture Content	----	1.0	%		**14.4**	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		**10**	----	----	----	----
Cadmium	7440-43-9	1	mg/kg		<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg		**26**	----	----	----	----
Copper	7440-50-8	5	mg/kg		**13**	----	----	----	----
Lead	7439-92-1	5	mg/kg		**30**	----	----	----	----
Nickel	7440-02-0	2	mg/kg		**14**	----	----	----	----
Zinc	7440-66-6	5	mg/kg		**30**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		<50	----	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		<50	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	----	----	----
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	Dup-6	----	----	----	----
				Client sampling date / time	28-Mar-2019 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM1904596-001	--------	--------	--------	--------
					Result	----	----	----	----
EP080: BTEXN - Continued									
^ **Total Xylenes**	----	0.5	mg/kg		<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**67.8**	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		**69.5**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		**76.4**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	51	125
Toluene-D8	2037-26-5	55	125
4-Bromofluorobenzene	460-00-4	56	124

QUALITY CONTROL REPORT

Work Order	: **EM1904596**	Page	: 1 of 5
Client	: **ENVIRONMENTAL PROJECTS**	Laboratory	: Environmental Division Melbourne
Contact	: BRAD FITZGERALD	Contact	: Customer Services EM
Address	: LEVEL 3 117 KING WILLIAM ST ADELAIDE SA 5001	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: +61 08 8410 1846	Telephone	: +61-3-8549 9600
Project	: 19032.01	Date Samples Received	: 29-Mar-2019
Order number	:	Date Analysis Commenced	: 02-Apr-2019
C-O-C number	: ----	Issue Date	: 04-Apr-2019
Sampler	: ----		
Site	: ----		
Quote number	: EN/333		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 2272052)									
EM1904517-021	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	44	54	19.5	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	39	41	6.37	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	36	29	19.8	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	14	10	31.7	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	75	75	0.00	0% - 50%
EM1904541-002	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	30	30	0.00	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	17	17	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	7	7	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	11	12	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	11	12	0.00	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2272371)									
EM1904560-028	Anonymous	EA055: Moisture Content	----	0.1	%	17.3	15.7	9.84	0% - 50%
EM1904563-004	Anonymous	EA055: Moisture Content	----	0.1	%	13.8	11.4	19.7	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2272051)									
EM1904517-002	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EM1904541-002	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2271911)									
EM1904265-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EM1904677-002	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2272295)									

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2272295) - continued									
EM1904560-010	Anonymous	EP071: C15 - C28 Fraction	---	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	---	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	---	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	---	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2271911)									
EM1904265-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EM1904677-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2272295)									
EM1904560-010	Anonymous	EP071: >C16 - C34 Fraction	---	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	---	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	---	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	---	50	mg/kg	<50	<50	0.00	No Limit
EP080: BTEXN (QC Lot: 2271911)									
EM1904265-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EM1904677-002	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2272052)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	91.9	78	107
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	88.5	76	108
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	96.8	78	110
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	95.5	78	108
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	89.6	78	106
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	97.0	80	109
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	94.2	79	110
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2272051)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	88.5	77	104
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2271911)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	77.8	61	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2272295)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	806 mg/kg	77.0	72	122
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	3006 mg/kg	88.4	84	123
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1584 mg/kg	84.6	79	119
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2271911)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	75.9	60	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2272295)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	1160 mg/kg	80.5	77	121
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	3978 mg/kg	86.6	83	121
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	313 mg/kg	76.9	65	123
EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP080: BTEXN (QCLot: 2271911)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	69.4	63	119
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	74.0	67	126
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	70.6	66	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	77.0	68	128
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	76.2	73	128
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	72.3	61	123

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2272052)							
EM1904517-022	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	94.1	78	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	89.7	84	116
		EG005T: Chromium	7440-47-3	50 mg/kg	99.6	79	121
		EG005T: Copper	7440-50-8	50 mg/kg	99.8	82	124
		EG005T: Lead	7439-92-1	50 mg/kg	91.4	76	124
		EG005T: Nickel	7440-02-0	50 mg/kg	95.5	78	120
		EG005T: Zinc	7440-66-6	50 mg/kg	95.6	74	128
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2272051)							
EM1904517-009	Anonymous	EG035T: Mercury	7439-97-6	0.5 mg/kg	95.5	76	116
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2271911)							
EM1904265-005	Anonymous	EP080: C6 - C9 Fraction	----	28 mg/kg	82.1	42	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2272295)							
EM1904560-024	Anonymous	EP071: C10 - C14 Fraction	----	806 mg/kg	77.0	53	123
		EP071: C15 - C28 Fraction	----	3006 mg/kg	88.0	70	124
		EP071: C29 - C36 Fraction	----	1584 mg/kg	83.1	64	118
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2271911)							
EM1904265-005	Anonymous	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	79.6	39	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2272295)							
EM1904560-024	Anonymous	EP071: >C10 - C16 Fraction	----	1160 mg/kg	80.3	65	123
		EP071: >C16 - C34 Fraction	----	3978 mg/kg	85.9	67	121
		EP071: >C34 - C40 Fraction	----	313 mg/kg	71.6	44	126
EP080: BTEXN (QCLot: 2271911)							
EM1904265-005	Anonymous	EP080: Benzene	71-43-2	2 mg/kg	94.6	50	136
		EP080: Toluene	108-88-3	2 mg/kg	94.3	56	139

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM1904596**	Page	: 1 of 4
Client	: **ENVIRONMENTAL PROJECTS**	Laboratory	: Environmental Division Melbourne
Contact	: BRAD FITZGERALD	Telephone	: +61-3-8549 9600
Project	: 19032.01	Date Samples Received	: 29-Mar-2019
Site	: ----	Issue Date	: 04-Apr-2019
Sampler	: ----	No. of samples received	: 1
Order number	:	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container* / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved (EA055)							
Dup-6	**28-Mar-2019**	**----**	----	----	**02-Apr-2019**	11-Apr-2019	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
Dup-6	**28-Mar-2019**	**03-Apr-2019**	24-Sep-2019	✓	**03-Apr-2019**	24-Sep-2019	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
Dup-6	**28-Mar-2019**	**03-Apr-2019**	25-Apr-2019	✓	**03-Apr-2019**	25-Apr-2019	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080)							
Dup-6	**28-Mar-2019**	**02-Apr-2019**	11-Apr-2019	✓	**02-Apr-2019**	11-Apr-2019	✓
Soil Glass Jar - Unpreserved (EP071)							
Dup-6	**28-Mar-2019**	**03-Apr-2019**	11-Apr-2019	✓	**03-Apr-2019**	13-May-2019	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080)							
Dup-6	**28-Mar-2019**	**02-Apr-2019**	11-Apr-2019	✓	**02-Apr-2019**	11-Apr-2019	✓
Soil Glass Jar - Unpreserved (EP071)							
Dup-6	**28-Mar-2019**	**03-Apr-2019**	11-Apr-2019	✓	**03-Apr-2019**	13-May-2019	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
Dup-6	**28-Mar-2019**	**02-Apr-2019**	11-Apr-2019	✓	**02-Apr-2019**	11-Apr-2019	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Total Mercury by FIMS	EG035T	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Total Mercury by FIMS	EG035T	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Total Mercury by FIMS	EG035T	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM amended 2013.

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EM1904596**

Client	: **ENVIRONMENTAL PROJECTS**	Laboratory	: Environmental Division Melbourne
Contact	: BRAD FITZGERALD	Contact	: Customer Services EM
Address	: LEVEL 3 117 KING WILLIAM ST ADELAIDE SA 5001	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: brad.fitzgerald@environmentalprojects.com.au	E-mail	: ALSEnviro.Melbourne@alsglobal.com
Telephone	: +61 08 8410 1846	Telephone	: +61-3-8549 9600
Facsimile	: +61 08 8410 1846	Facsimile	: +61-3-8549 9626
Project	: 19032.01	Page	: 1 of 3
Order number	:	Quote number	: EM2018ENVIPR0001 (EN/333)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	:		

Dates

Date Samples Received	: 29-Mar-2019 13:00	Issue Date	: 29-Mar-2019
Client Requested Due Date	: 05-Apr-2019	Scheduled Reporting Date	: **05-Apr-2019**

Delivery Details

Mode of Delivery	: Undefined	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 10.6°C - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 1 / 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **Analytical work for this work order will be conducted at ALS Springvale.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	SOIL - EA055-103 Moisture Content	SOIL - S-05 TRH/BTEXN/8 Metals
EM1904596-001	28-Mar-2019 00:00	Dup-6	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)	Email	accounts@environmentalprojects.com.au

BRAD FITZGERALD

- *AU Certificate of Analysis - NATA (COA)	Email	brad.fitzgerald@environmentalprojects.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	brad.fitzgerald@environmentalprojects.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	brad.fitzgerald@environmentalprojects.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	brad.fitzgerald@environmentalprojects.com.au
- A4 - AU Tax Invoice (INV)	Email	brad.fitzgerald@environmentalprojects.com.au
- Chain of Custody (CoC) (COC)	Email	brad.fitzgerald@environmentalprojects.com.au
- EDI Format - ENMRG (ENMRG)	Email	brad.fitzgerald@environmentalprojects.com.au
- EDI Format - ESDAT (ESDAT)	Email	brad.fitzgerald@environmentalprojects.com.au

Lab Results

- *AU Certificate of Analysis - NATA (COA)	Email	Lab.Results@environmentalprojects.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	Lab.Results@environmentalprojects.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	Lab.Results@environmentalprojects.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	Lab.Results@environmentalprojects.com.au
- A4 - AU Tax Invoice (INV)	Email	Lab.Results@environmentalprojects.com.au
- Chain of Custody (CoC) (COC)	Email	Lab.Results@environmentalprojects.com.au
- EDI Format - ENMRG (ENMRG)	Email	Lab.Results@environmentalprojects.com.au
- EDI Format - ESDAT (ESDAT)	Email	Lab.Results@environmentalprojects.com.au

CHAIN OF CUSTODY DOCUMENTATION - Environmental Projects

Project Title :	Mcindie Soil Sampling		
Job Number :	19032.01		
Project Manager:	Brad Fitzgerald		
Phone:	0422 482 364	**Primary Laboratory:**	Enviolab
Email:	brad.fitzgerald@environmentalprojects.com.au	**Laboratory Quote Ref:**	
Results to:	Lab.Results@environmentalprojects.com.au brad.fitzgerald@environmentalprojects.com.au	**Secondary Laboratory:**	ALS
Invoice to:	Lab.Results@environmentalprojects.com.au brad.fitzgerald@environmentalprojects.com.au	**Laboratory Quote Ref:**	

COC REFERENCE	Turnaround Required
19032.01 COC-1	Standard

SAMPLE DETAILS					CHEMICAL TESTING REQUIRED									
Contract Laboratory Sample ID	Sample ID	Sample Depth	Date Sampled	Sample Matrix	Metals (13)	TRH (C6-C10)	TRH + BTEX + Metals (8)	TRH + BTEX + PAHs + Metals (8)	VOCs	NEPM Screen				Additional Comments / Notes
	SB6-1	0.0-0.1	28/03/2019	Soil										
	SB6-2	0.15-0.25	28/03/2019	Soil			1							
	SB8-3	0.55-0.65	28/03/2019	Soil										
	SB8-4	0.9-1.0	28/03/2019	Soil										
	SB7-1	0.0-0.1	28/03/2019	Soil			1		1					
	SB7-2	0.15-0.25	28/03/2019	Soil				1						
	SB7-3	0.4-0.5	28/03/2019	Soil										
	SB7-4	0.8-0.9	28/03/2019	Soil										
	SB8-1	0.0-0.1	28/03/2019	Soil										
	SB8-2	0.2-0.3	28/03/2019	Soil						1				
	SB8-3	0.3-0.4	28/03/2019	Soil										
	SB8-4	0.7-0.8	28/03/2019	Soil										
	SB8-5	0.9-1.0	28/03/2019	Soil										
	Dup-1	-	28/03/2019	Soil										
	Dup-2	-	28/03/2019	Soil										
	Dup-3	-	28/03/2019	Soil										
	Dup-4	-	28/03/2019	Soil										
	Dup-5	-	28/03/2019	Soil										
	Dup-6	-	28/03/2019	Soil			1	SEND TO ALS FOR TRH + BTEX + Metals (8) ANALYSIS						
	Dup-7	-	28/03/2019	Soil			1							
	Dup-8	-	28/03/2019	Soil										
EP AUTHORISATION			**LABORATORY RECEIPT**		0	0	4	1	1	1				

Requested by:	Received by:	Additional Comments
Date/time requested:	Date/time received: 29/3 13:00	
Signature:	Signature:	

Environmental Division
Melbourne
Work Order Reference
EM1904596

Telephone : + 61-3-8549 9600