ENVIRONMENTAL INVESTIGATION SERVICES

13/10/2017
Report Ref: E30809Klet-WC

Austino Sydney Olympic Park Pty Ltd
Suite 603
377 Sussex Street
Haymarket NSW 2000

Attention: Mr Will Wang

WASTE CLASSIFICATION ASSESSMENT
PROPOSED RESIDENTIAL DEVELOPMENT
2 MURRAY ROSE AVENUE, SYDNEY OLYMPIC PARK, NSW

1 INTRODUCTION

Austino Sydney Olympic Park Pty Ltd ('the client') commissioned Environmental Investigation Services (EIS)[1] to assign a waste classification to the in-situ soil located at 2 Murray Rose Avenue, Sydney Olympic Park, NSW ('the site'). The site location is shown on Figure 1 and sampling for the screening was confined to the in-situ soil in the investigation area as shown on Figure 2 attached in the appendices.

The purpose of this assessment was to provide a waste classification for the off-site disposal of the material in accordance with the NSW EPA Waste Classification Guidelines - Part 1: Classifying Waste (2014[2]). The assessment was undertaken generally in accordance with an EIS proposal (Ref: EP45452K.rev1) of 23 August 2017 and written acceptance from Austino Property Group of 24 August 2017.

A geotechnical investigation was undertaken in conjunction with the waste classification assessment by JK Geotechnics[3] and the results are presented in a separate report (Ref. 30809YF).

1.1 Proposed Development Details

The proposed development includes the construction of a 15 storey residential development with two (2) basement levels with a bulk excavation level of approximately RL-0.4m.

[1] Environmental consulting division of Jeffery & Katauskas Pty Ltd (J&K)

[2] NSW EPA, (2014). *Waste Classification Guidelines, Part 1: Classifying Waste.* (referred to as Waste Classification Guidelines 2014)

[3] Geotechnical consulting division of J&K

Postal Address: PO Box 976, North Ryde BC NSW 1670
Tel: 02 9888 5000 ● Fax: 9888 5004
EIS is a division of Jeffery and Katauskas Pty Ltd ● ABN 17 003 550 801

2 SITE INFORMATION

2.1 Site Identification and Description

Table 2-1: Site Identification

Site Address:	2 Murray Avenue, Sydney Olympic Park, NSW
Lot & Deposited Plan:	Lot 2 in DP1185060
Current Land Use:	Site Compound for Lend Lease
Approximate Area Applicable to Waste Classification (m^2):	2,530m^2
Geographical Location (approx.):	Latitude: -33.84427 Longitude: 151.075412

The site is located on the southern side of Murray Rose Avenue and bound by Bennelong Parkway to the east. The site is situated within undulating regional topography with a general slope down to the east of approximately 4° towards the Parramatta River.

At the time of the inspection the site was occupied by Lend Lease as a site office for the adjacent construction site. The site was accessed from Murray Rose Avenue via a gravel covered driveway which was connected to a paved car park at the rear. Several site sheds were situated across the site including a site office, amenities, lunch shed and storage sheds. At the rear (southern) boundary of the car park was a small strip of garden bed with some large established trees. No sign of stress or dieback was identified.

2.2 Background/Historical Information

EIS were not provided with any historical reports or background information for the site. On this basis, EIS has undertaken a preliminary historical assessment based on a review of the following information:

- The 1943 and 2014 aerial photographs for the site provided by SIX Maps[4]; and
- The contaminated land records provided by the NSW EPA[5].

Based on interpretation of the aerial photographs, EIS are of the opinion that the land use at the site appeared to be used for agricultural purposes from sometime prior to 1943. The immediate surrounds also appeared to be developed for agricultural and grazing purposes from 1943 with an open brick pit located approximately 250m north of the site. There were no records for the site on the NSW EPA contaminated land registers.

[4] https://maps.six.nsw.gov.au/

[5] http://www.epa.nsw.gov.au/

Considering the above information, the waste classification assessment will consider a broad suite of potential contaminants as outlined in Section 4.4.

2.3 Regional Geology

The geological map of Sydney (1983[6]) indicates the site to be underlain by Ashfield Shale of the Wianamatta Group, which typically consists of black to dark grey shale and laminate.

3 ASSESSMENT CRITERIA

3.1 NSW EPA Waste Classification Guidelines

Off-site disposal of fill, contaminated material, stockpiled soil, natural soil, rock excavated as part of the proposed development works is regulated by the Protection of the Environment Operations Act (1997[7]) and associated regulations and guidelines including the Part 1 of the Waste Classification Guidelines.

Soils are classed into the following categories based on the chemical contaminant criteria outlined in the guidelines:

Table 3-1: Waste Categories

Category	Description
General Solid Waste (non-putrescible) (GSW)	• If Specific Contaminant Concentration (SCC) ≤ Contaminant Threshold (CT1) then Toxicity Characteristics Leaching Procedure (TCLP) not needed to classify the soil as GSW • If TCLP ≤ TCLP1 and SCC ≤ SCC1 then treat as GSW
Restricted Solid Waste (non-putrescible) (RSW)	• If SCC ≤ CT2 then TCLP not needed to classify the soil as RSW • If TCLP ≤ TCLP2 and SCC ≤ SCC2 then treat as RSW
Hazardous Waste (HW)	• If SCC > CT2 then TCLP not needed to classify the soil as HW • If TCLP > TCLP2 and/or SCC > SCC2 then treat as HW
Virgin Excavated Natural Material (VENM)	Natural material (such as clay, gravel, sand, soil or rock fines) that meet the following: • That has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial mining or agricultural activities; • That does not contain sulfidic ores or other waste; and • Includes excavated natural material that meets such criteria for virgin excavated natural material as may be approved from time to

[6] *1:100,000 Geological Map of Sydney (Series 9130),* Department of Mineral Resources (1983) [now Department of Primary Industries]

[7] NSW Government, (1997). *Protection of Environment Operations Act.* (POEO Act 1997)

Category	Description
	time by a notice published in the NSW Government Gazette.

4 INVESTIGATION PROCEDURE

4.1 Subsurface Investigation and Soil Sampling

Field work for this investigation was undertaken over three days on 4, 9 and 10 September 2017. Soil samples were obtained from four (4) boreholes drilled for the JK geotechnical investigation and two (2) additional boreholes drilled for this investigation. The sampling locations are shown on Figure 2 attached in the appendices.

The sample locations for the JK geotechnical investigation were drilled using a track mounted hydraulically operated drill rig equipped with spiral flight augers. Soil samples were obtained from a Standard Penetration Test (SPT) sampler or directly from the auger when conditions did not allow use of the SPT sampler.

The additional sample locations for this investigation were drilled using a four-wheel-drive (4wd) mounted hydraulically operated push tube rig. Soil samples were obtained from disposable polyethylene push tube samplers.

Soil samples were collected from the fill and natural profiles encountered during the investigation. Additional fill samples were obtained when relatively deep fill (>0.5m) was encountered. Samples were also obtained when there was a distinct change in lithology or based on the observations made during the investigation. All samples were recorded on the borehole logs attached in the appendices.

Samples were placed in glass jars with plastic caps and Teflon seals with minimal headspace. Samples for asbestos analysis were placed in zip-lock plastic bags. Sampling personnel used disposable nitrile gloves during sampling activities. The samples were labelled with the job number, sampling location, sampling depth and date.

4.2 Screening for Volatile Organic Compounds (VOCs)

A portable Photoionisation Detector (PID) was used to screen the samples for the presence of VOCs and to assist with selection of samples for further analysis for petroleum hydrocarbons. PID screening for VOCs was undertaken on soil samples using the soil sample headspace method. VOC data was obtained from partly filled zip-lock plastic bags following equilibration of the headspace gases.

The sensitivity of the PID is dependent on the organic compound and varies for different mixtures of hydrocarbons. Some compounds give relatively high readings and some can be undetectable even though present in identical concentrations. The portable PID is best used semi-quantitatively to

compare samples contaminated by the same hydrocarbon source. The PID is calibrated before use by measurement of an isobutylene standard gas. All the PID measurements are quoted as parts per million (ppm) isobutylene equivalents.

4.3 Sample Preservation

Soil samples were preserved by immediate storage in an insulated sample container with ice in accordance with AS4482.1-2005 and AS4482.2-1999[8] as summarised in the following table:

Table 4-1: Soil Sample Preservation and Storage

Analyte	Preservation	Storage
Heavy metals	Unpreserved glass jar with Teflon lined lid	Store at <4°, analysis within 28 days (mercury and Cr[VI]) and 180 days (other metals)
Hydrocarbons, pesticides and other organics	As above	Store at <4°, analysis within 14 days
Asbestos	Sealed plastic bag	None

On completion of the fieldwork, the samples were delivered in the insulated sample container to a NATA registered laboratory for analysis under standard Chain of Custody (COC) procedures.

4.4 Laboratory Analysis

Samples were analysed for a range of potential contaminants based on the site information presented in Section 2. EIS note that a detailed site history assessment was not undertaken, however this was compensated for by analysing the samples for a broad range of potential contaminants.

Six (6) selected in-situ fill soil samples were analysed for the following:

- Heavy metals including: arsenic, cadmium, chromium (total), copper, lead, mercury, nickel and zinc;
- Polycyclic Aromatic Hydrocarbons (PAHs);
- Total Recoverable Hydrocarbons (TRH);
- Monocyclic aromatic hydrocarbons including benzene, toluene, ethylbenzene and xylene (BTEX);
- Organochlorine pesticides (OCPs);
- Organophosphate pesticides (OPPs);
- Polychlorinated biphenyls (PCBs);
- Asbestos; and
- TCLP leachate analysis for PAHs and/or heavy metals where required.

[8] *Guide to the Sampling and Investigation of Potentially Contaminated Soil Part2: Volatile Substances,* Standards Australia, 1999 (AS 1999)

Three (3) selected in-situ natural soil samples were analysed for the following:

- Heavy metals (as above);
- BTEX;
- PAHs; and
- TRH.

Samples were analysed by Envirolab Services (NATA Accreditation Number – 2901) using the analytical methods detailed in the National Environmental Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013[9]). Reference should be made to the laboratory reports (Ref: 175054 & 175054-A) attached in the appendices for further information.

5 RESULTS OF THE INVESTIGATION

5.1 Subsurface Conditions

A summary of the subsurface soil conditions encountered during the investigation is presented in the table below. Reference should be made to the borehole logs attached in the appendices for further details.

Table 5-1: Summary of Subsurface Conditions

Profile	Description (depth in m below ground level)
Pavement	Pavement was encountered in BH2 and BH4 and ranged in thickness from 0.03m to 0.05m.
Fill	Fill material was encountered in all boreholes and extended to depths of between 1.0m to 1.4m below ground level. The fill typically comprised gravelly silty clay and silty clay. The fill contained inclusions of igneous gravel, ash and sandstone gravel. Odours or staining were not observed in the fill during the investigation. Potential asbestos containing material was not observed.
Natural Soil	Silty clay natural soil was encountered in all boreholes to a maximum depth of 2.2m. Odours or staining were not observed in the natural soil during the investigation.
Bedrock	Shale bedrock was encountered in BH1, BH2, BH3 and BH4 at depths of between 1.7m and 2.2m. Odours or staining were not observed in the bedrock during the investigation.
Groundwater	Seepage was encountered in BH4 at a depth of approximately 4.75m. Seepage was not encountered in the remaining boreholes.

[9] National Environment Protection Council (NEPC), (2013). *National Environmental Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013).* (referred to as NEPM 2013)

5.2 VOC Screening

PID soil sample headspace readings are presented in the COC documents attached in the appendices. All results were 0ppm equivalent isobutylene which indicates a lack of PID detectable VOCs.

5.3 Laboratory Results

The laboratory results were assessed against the criteria presented in Part 1 of the Waste Classification Guidelines, as summarised previously in this report. The results are presented in the report tables attached in the appendices. A summary of the results is presented below.

Table 5-2: Summary of Soil Laboratory Results Compared to CT and SCC Criteria

Analyte	No. of Samples Analysed	No. of Results > CT Criteria	No. of Results > SCC Criteria	Comments
Heavy Metals	9	2	0	Nickel concentrations exceeded the CT1 criterion in two fill samples collected from BH2 (0.05-0.1m) and BH3 (0.1-0.2m). The maximum nickel concentration was 110mg/kg. TCLP leachate analysis was conducted on these two samples.
TRH	9	0	0	All results were below the laboratory practical quantitation limits (PQLs).
BTEX	9	0	0	All results were below the laboratory PQLs.
Total PAHs	9	0	0	All results were below the Ct1 criteria.
Benzo(a)pyrene	9	0	0	All results were below the CT1 criterion.
OCPs & OPPs	6	0	0	All results were below the laboratory PQLs.
PCBs	6	0	0	All results were below the laboratory PQLs.
Asbestos	6	-	-	Asbestos was not detected in the samples analysed.

Table 5-3: Summary of Soil Laboratory Results Compared to TCLP Criteria

Analyte	No. of Samples Analysed	No. of Results > TCLP Criteria	Comments
Nickel	2	0	The two fill samples with nickel concentrations above the CT1 criterion were analysed for TCLP nickel. All results were below the TCLP1 criteria for nickel.

6 CONCLUSIONS

6.1 Waste Classification of Fill

Based on the results of the assessment, and at the time of reporting, the fill material is classified as **General Solid Waste (non-putrescible)**. Surplus fill should be disposed of to a landfill that is licensed by the NSW EPA to receive this waste stream. The landfill should be contacted to obtain the required approvals prior to commencement of excavation.

6.2 Classification of Natural Soil

Based on the scope of work undertaken for this assessment, and at the time of reporting, EIS are of the opinion that the natural soil at the site may meet the definition of VENM for off-site disposal or re-use purposes. EIS recommend additional testing should be conducted on the natural soil and bedrock following the removal of the fill material.

VENM is considered suitable for re-use on-site, or alternatively, the information included in this report may be used to assess whether the material is suitable for beneficial reuse at another site as fill material. In accordance with Part 1 of the Waste Classification Guidelines, the VENM is pre-classified as general solid waste and can also be disposed of accordingly to a facility that is licensed to accept it.

6.3 Recommendations

Any unexpected finds encountered during the site works should be inspected by a suitably qualified environmental consultant from a company that is a member of the Australian Contaminated Land Consultants Association (ACLCA). In the event that the find has the potential to alter the waste classification documented in this report, additional testing and reporting should be undertaken.

6.4 General Information

The fill material must be disposed of to a facility licensed by the NSW EPA to accept the waste. It is the responsibility of the receiving facility to ensure that the material meets their EPA license conditions. EIS accepts no liability whatsoever for illegal or inappropriate disposal of material.

Fill and contaminated soil disposal costs are significant and may affect project viability. These costs should be assessed at an early stage of the project development to avoid significant future unexpected additional costs.

Material classed as VENM must not be mixed with any fill material (including building rubble) as this will invalidate the VENM classification. Where doubt exists about the difference between fill and VENM material an environmental/geotechnical engineer should be contacted for advice.

Section 143 of the POEO Act 1997 states that if waste is transported to a place that cannot lawfully be used as a waste facility for that waste, then the transporter and owner of the waste are each guilty of an offence. The transporter and owner of the waste have a duty to ensure that the waste is disposed of in an appropriate manner. EIS accepts no liability whatsoever for the unlawful disposal of any waste from any site.

7 LIMITATIONS

The report limitations are outlined below:

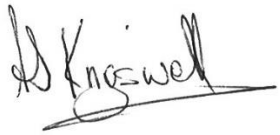
- EIS accepts no responsibility for any unidentified contamination issues at the site. Any unexpected problems/subsurface features that may be encountered during development works should be inspected by an environmental consultant as soon as possible;
- This report has been prepared based on site conditions which existed at the time of the investigation; scope of work and limitation outlined in the EIS proposal; and terms of contract between EIS and the client (as applicable);
- The conclusions presented in this report are based on investigation of conditions at specific locations, chosen to be as representative as possible under the given circumstances, visual observations of the site and immediate surrounds and documents reviewed as described in the report;
- Subsurface soil and rock conditions encountered between investigation locations may be found to be different from those expected. Groundwater conditions may also vary, especially after climatic changes;
- The investigation and preparation of this report have been undertaken in accordance with accepted practice for environmental consultants, with reference to applicable environmental regulatory authority and industry standards, guidelines and the assessment criteria outlined in the report;
- Where information has been provided by third parties, EIS has not undertaken any verification process, except where specifically stated in the report;
- EIS has not undertaken any assessment of off-site areas that may be potential contamination sources or may have been impacted by site contamination, except where specifically stated in the report;
- EIS accept no responsibility for potentially asbestos containing materials that may exist at the site. These materials may be associated with demolition of pre-1990 constructed buildings or fill material at the site;
- EIS have not and will not make any determination regarding finances associated with the site;

- Additional investigation work may be required in the event of changes to the proposed development or landuse. EIS should be contacted immediately in such circumstances;
- Material considered to be suitable from a geotechnical point of view may be unsatisfactory from a soil contamination viewpoint, and vice versa;
- This report has been prepared for the particular project described and no responsibility is accepted for the use of any part of this report in any other context or for any other purpose;
- Copyright in this report is the property of EIS. EIS has used a degree of care, skill and diligence normally exercised by consulting professionals in similar circumstances and locality. No other warranty expressed or implied is made or intended. Subject to payment of all fees due for the investigation, the client alone shall have a licence to use this report;
- If the client, or any person, provides a copy of this report to any third party, such third party must not rely on this report except with the express written consent of EIS; and
- Any third party who seeks to rely on this report without the express written consent of EIS does so entirely at their own risk and to the fullest extent permitted by law, EIS accepts no liability whatsoever, in respect of any loss or damage suffered by any such third party.

If you have any questions concerning the contents of this letter please do not hesitate to contact us.

Kind Regards

Harry Leonard
Environmental Scientist



Adrian Kingswell
Principal

Appendices:

Appendix A: Report Figures
Appendix B: Laboratory Summary Tables
Appendix C: Borehole Logs
Appendix D: Laboratory Report/s & COC Documents

Appendix A: Report Figures

AERIAL IMAGE SOURCE: GOOGLE EARTH PRO 7.1.5.1557
AERIAL IMAGE ©: 2015 GOOGLE INC.

This plan should be read in conjunction with the EIS report.

Title: **SITE LOCATION PLAN**

Location: 2 MURRAY ROSE AVENUE
SYDNEY OLYMPIC PARK, NSW

Report No: E30809K

Figure No: 1

ENVIRONMENTAL INVESTIGATION SERVICES

EIS

PLOT DATE: 10/10/2017 10:59:19 AM DWG FILE: S:\S EIS\SC EIS JOBS\30000'S\E30809K SYDNEY OLYMPIC PARK\CAD\E30809K.DWG

BH1(1.4)

BH6(1.3)

BH2(1.2)

BH4(1.2)

BH3(1.3)

BH5(1.0)

BM GIN IN KERB
R.L. 8.95 (A.H.D.)

HIGH RISE CONSTRUCTION SITE

SITE SHED AREA

SITE SHEDS

ACCESS ROAD

BENNELONG PARKWAY

LEGEND

APPROXIMATE SITE BOUNDARY

BH (Fill Depth) — BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m)

SCALE 1:400 @A3 METRES (0 4 8 12 16 20)

This plan should be read in conjunction with the EIS report.

Title: **SAMPLE LOCATION PLAN**

Location: 2 MURRAY ROSE AVENUE
SYDNEY OLYMPIC PARK, NSW

Report No: E30809K

Figure No: 2

ENVIRONMENTAL INVESTIGATION SERVICES

EIS

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Appendix B: Laboratory Summary Tables

Waste Classification Assessment
2 Murray Rose Avenue, Sydney Olympic Park, NSW
E30809K

TABLE A
SOIL LABORATORY RESULTS COMPARED TO WASTE CLASSIFICATION GUIDELINES
All data in mg/kg unless stated otherwise

			HEAVY METALS								PAHs		OC/OP PESTICIDES				Total PCBs	TRH					BTEX COMPOUNDS				ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P	Total Endosulfans	Chloropyrifos	Total Moderately Harmful [2]	Total Scheduled[3]		C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	Total C_{10}-C_{36}	Benzene	Toluene	Ethyl benzene	Total Xylenes	
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.05	0.1	0.1	0.1	0.1	0.1	25	50	100	100	250	0.2	0.5	1	3	100
General Solid Waste CT1 [1]			100	20	100	NSL	100	4	40	NSL	200	0.8	60	4	250	<50	<50	650		NSL		10,000	10	288	600	1,000	-
General Solid Waste SCC1 [1]			500	100	1900	NSL	1500	50	1050	NSL	200	10	108	7.5	250	<50	<50	650		NSL		10,000	18	518	1,080	1,800	-
Restricted Solid Waste CT2 [1]			400	80	400	NSL	400	16	160	NSL	800	3.2	240	16	1000	<50	<50	2600		NSL		40,000	40	1,152	2,400	4,000	-
Restricted Solid Waste SCC2 [1]			2000	400	7600	NSL	6000	200	4200	NSL	800	23	432	30	1000	<50	<50	2600		NSL		40,000	72	2,073	4,320	7,200	-
Sample Reference	**Sample Depth**	**Sample Description**																									
BH1	0.8-1.0	Fill - Silty clay	7	LPQL	13	28	18	LPQL	11	31	0.9	0.1	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	Not Detected
BH2	0.05-0.1	Fill - Silty clay	LPQL	LPQL	12	58	2	LPQL	**100**	35	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	Not Detected
BH3	0.1-0.2	Fill - Silty clay	LPQL	LPQL	11	58	2	LPQL	**110**	35	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	Not Detected
BH3	1.5-1.8	Silty clay	20	LPQL	10	46	43	LPQL	11	50	0.2	0.06	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH4	0.5-0.65	Fill - Silty clay	9	LPQL	16	39	19	LPQL	28	39	2.3	0.3	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	Not Detected
BH4	1.3-1.5	Silty clay	9	LPQL	18	45	24	LPQL	4	15	0.4	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH5	0-0.2	Fill - Silty clay	9	LPQL	14	31	21	LPQL	35	57	1.4	0.2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	Not Detected
BH5	1.0-1.2	Silty clay	5	LPQL	22	21	24	LPQL	7	15	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH6	0.9-1.1	Fill - Silty clay	18	LPQL	13	34	34	LPQL	6	27	0.8	0.1	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	Not Detected
Total Number of samples			9	9	9	9	9	9	9	9	9	9	6	6	6	6	6	9	9	9	9	9	9	9	9	9	6
Maximum Value			20	LPQL	22	58	43	LPQL	110	57	2.3	0.3	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NC

Explanation:

[1] - NSW EPA Waste Classification Guidelines, Part 1: Classifying Waste (2014)

[2] - Assessment of Total Moderately Harmful pesticides includes: Dichlorovos, Dimethoate, Fenitrothion, Ethion, Malathion and Parathion

[3] - Assessment of Total Scheduled pesticides include: HBC, alpha-BHC, gamma-BHC, beta-BHC, Heptachlor, Aldrin, Heptachlor Epoxide, gamma-Chlordane, alpha-chlordane, pp-DDE, Dieldrin, Endrin, pp-DDD, pp-DDT, Endrin Aldehyde

Concentration above the CT1 — **VALUE**
Concentration above SCC1 — **VALUE**
Concentration above the SCC2 — **VALUE**

Abbreviations:

PAHs: Polycyclic Aromatic Hydrocarbons
B(a)P: Benzo(a)pyrene
PQL: Practical Quantitation Limit
LPQL: Less than PQL
PID: Photoionisation Detector
PCBs: Polychlorinated Biphenyls
UCL: Upper Level Confidence Limit on Mean Value
NA: Not Analysed
NC: Not Calculated
NSL: No Set Limit
SAC: Site Assessment Criteria
TRH: Total Recoverable Hydrocarbons
CT: Contaminant Threshold
SCC: Specific Contaminant Concentration
HILs: Health Investigation Levels
NEPM: National Environmental Protection Measure
BTEX: Monocyclic Aromatic Hydrocarbons

TABLE B

SOIL LABORATORY TCLP RESULTS

All data in mg/L unless stated otherwise

			Nickel
PQL - Envirolab Services			0.02
TCLP1 - General Solid Waste [1]			2
TCLP2 - Restricted Solid Waste [1]			8
TCLP3 - Hazardous Waste [1]			>8
Sample Reference	**Sample Depth**	**Sample Description**	
BH2	0.05-0.1	Fill - Silty Clay	0.1
BH3	0.1-0.2	Fill - Silty Clay	0.2
Total Number of samples			2
Maximum Value			0.2

Explanation:

1 - NSW EPA Waste Classification Guidelines, Part 1: Classifying Waste (2014)

General Solid Waste	**VALUE**
Restricted Solid Waste	**VALUE**
Hazardous Waste	**VALUE**

Abbreviations:

PQL: Practical Quantitation Limit

LPQL: Less than PQL

B(a)P: Benzo(a)pyrene

NC: Not Calculated

NA: Not Analysed

TCLP: Toxicity Characteristics Leaching Procedure

Appendix C: Borehole Logs

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 1
1 / 3

BOREHOLE LOG

Client: AUSTINO PROPERTY GROUP
Project: PROPOSED RESIDENTIAL DEVELOPMENT
Location: 2 MURRAY ROSE AVENUE, SYDNEY OLYMPIC PARK, NSW

Job No.: 30809YF **Method:** SPIRAL AUGER **R.L. Surface:** ~10.6 m
Date: 10/9/17 **Datum:** AHD
Plant Type: JK300 **Logged/Checked By:** K.S./O.F.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF AUGERING										FILL: Silty sandy clay, medium plasticity, orange brown, fine to coarse grained sand, with fine to coarse grained igneous, sandstone and shale gravel.	MC<PL			APPEARS MODERATELY TO WELL COMPACTED
					N = 12 3,6,6	10	1							
					N = 7 3,4,3	9	2		CH	SILTY CLAY: high plastiicty, grey mottled orange brown, with fine to coarse grained ironstone and shale gravel.	MC<PL	H	410 450 520	RESIDUAL
										SHALE: grey.	XW	EL - VL		VERY LOW 'TC' BIT RESISTANCE
						8	3			as above, but dark grey.	DW	L		LOW RESISTANCE
						7	4							
						6	5					L - M		LOW TO MODERATE RESISTANCE
						5								
						4	6			REFER TO CORED BOREHOLE LOG				

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 1
2 / 3

CORED BOREHOLE LOG

Client: AUSTINO PROPERTY GROUP
Project: PROPOSED RESIDENTIAL DEVELOPMENT
Location: 2 MURRAY ROSE AVENUE, SYDNEY OLYMPIC PARK, NSW

Job No.: 30809YF | **Core Size:** NMLC | **R.L. Surface:** ~10.6 m
Date: 10/9/17 | **Inclination:** VERTICAL | **Datum:** AHD
Plant Type: JK300 | **Bearing:** N/A | **Logged/Checked By:** K.S./O.F.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, structure, minor components.	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ EL -0.03, VL -0.1, L -0.3, M -1, H -3, VH -10, EH	DEFECT DETAILS DEFECT SPACING (mm) 500, 300, 100, 50, 30, 10 DESCRIPTION Type, inclination, thickness, planarity, roughness, coating. Specific / General
		5			START CORING AT 5.89m				
			6		CORE LOSS 0.86m				
100% RETURN		4			SHALE: dark grey, with light grey laminae, bedded at 0-5°.	SW	M - H		(6.87m) Be, 0°, P, S (7.20m) Be, 0°, P, S (7.29m) Jx 2, 90°, P, S (7.47m) Be, 0°, P, S (7.50m) Be, 0°, P, S (7.66m) Be, 0°, P, S
			7						
		3							
			8						
		2							(8.62m) XWS, 0°, 22 mm.t
			9						
		1							(9.37m) J, 70°, P, S
			10						(9.95m) J, 90°, P, S (9.98m) Be, 0°, P, S (10.06m) J, 70 - 90°, Un, S
		0							(10.66m) Be, 0°, P, S
			11						(11.05m) Be, 0°, P, S
		-1							(11.68m) Be, 0°, P, S

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 1
3 / 3

CORED BOREHOLE LOG

Client: AUSTINO PROPERTY GROUP
Project: PROPOSED RESIDENTIAL DEVELOPMENT
Location: 2 MURRAY ROSE AVENUE, SYDNEY OLYMPIC PARK, NSW

Job No.: 30809YF | **Core Size:** NMLC | **R.L. Surface:** ~10.6 m
Date: 10/9/17 | **Inclination:** VERTICAL | **Datum:** AHD
Plant Type: JK300 | **Bearing:** N/A | **Logged/Checked By:** K.S./O.F.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, structure, minor components.	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ EL .03 VL .1 L .3 M 1 H 3 VH 10 EH	DEFECT DETAILS DEFECT SPACING (mm) 500 300 100 50 30 10	DESCRIPTION Type, inclination, thickness, planarity, roughness, coating. Specific / General
100% RETURN		-2	13		SHALE: dark grey, with light grey laminae, bedded at 0-5°. *(continued)*	FR	H			(12.42m) XWS, 0°, 6 mm.t
		-3	14							(13.58m) XWS, 0°, 4 mm.t (13.64m) Be, 0°, P, S
		-4	15		END OF BOREHOLE AT 14.34 m					
		-5	16							
		-6	17							
		-7	18							
		-8								

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 2
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BOREHOLE LOG

Client: AUSTINO PROPERTY GROUP
Project: PROPOSED RESIDENTIAL DEVELOPMENT
Location: 2 MURRAY ROSE AVENUE, SYDNEY OLYMPIC PARK, NSW

Job No.: 30809YF **Method:** SPIRAL AUGER **R.L. Surface:** ~10.0 m
Date: 10/9/17 **Datum:** AHD
Plant Type: JK300 **Logged/Checked By:** K.S./O.F.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF AUGERING										ASPHALTIC CONCRETE : 30mm.t	M			
										FILL: Gravelly sand, fine to coarse grained, dark grey, fine to coarse grained igneous gravel.	MC~PL			APPEARS MODERATELY TO WELL COMPACTED
					N = 7 3,4,3					FILL: Silty clay, low to medium plasticity, dark grey and brown, with fine to coarse grained igneous and shale gravel.				
						9	1							
									CH	SILTY CLAY: high plasticity, light grey mottled red brown, with fine to coarse grained ironstone gravel.	MC<PL	VSt - H		RESIDUAL
					N = 7 4,3,4								450 390 470	
						8	2							
										SHALE: grey, with iron indurated bands.	XW	EL - VL		VERY LOW TO LOW 'TC' BIT RESISTANCE
										as above, but with XW bands.	DW	L		LOW TO MODERATE RESISTANCE
						7	3							
						6	4							
											XW	EL		VERY LOW RESISTANCE
						5	5							
										SHALE: dark grey.	DW	L - M		LOW RESISTANCE
						4	6							LOW TO MODERATE RESISTANCE
										REFER TO CORED BOREHOLE LOG				

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 2
2 / 3

CORED BOREHOLE LOG

Client: AUSTINO PROPERTY GROUP
Project: PROPOSED RESIDENTIAL DEVELOPMENT
Location: 2 MURRAY ROSE AVENUE, SYDNEY OLYMPIC PARK, NSW

Job No.: 30809YF | **Core Size:** NMLC | **R.L. Surface:** ~10.0 m
Date: 10/9/17 | **Inclination:** VERTICAL | **Datum:** AHD
Plant Type: JK300 | **Bearing:** N/A | **Logged/Checked By:** K.S./O.F.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, structure, minor components.	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ (EL .03, VL .1, L .3, M 1, H 3, VH 10, EH)	DEFECT DETAILS: DEFECT SPACING (mm) (500, 300, 100, 50, 30, 10)	DESCRIPTION: Type, inclination, thickness, planarity, roughness, coating. Specific / General
					START CORING AT 6.77m					
19/09/17	100% RETURN	3	7		SHALE: dark grey, with light grey lamiae, bedded at 0-5°.	DW	L - M			(6.87m) XWS, 0°, 62 mm.t (7.00m) XWS, 0°, 65 mm.t (7.09m) Cr, 0°, 12 mm.t
						SW	M - H			(7.35m) Cr, 0°, 6 mm.t
		2	8							(7.62m) Be, 0°, P, S (7.63m) J, 80°, P, S
										(8.27m) Be, 0°, P, S
		1	9							
										(9.40m) Be, 0°, P, S
		0	10							
		-1	11			FR	H			(11.00m) Be, 0°, P, S
		-2	12							(12.29m) Be, 5°, P, R

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No.
2
3 / 3

CORED BOREHOLE LOG

Client: AUSTINO PROPERTY GROUP
Project: PROPOSED RESIDENTIAL DEVELOPMENT
Location: 2 MURRAY ROSE AVENUE, SYDNEY OLYMPIC PARK, NSW

Job No.: 30809YF | **Core Size:** NMLC | **R.L. Surface:** ~10.0 m
Date: 10/9/17 | **Inclination:** VERTICAL | **Datum:** AHD
Plant Type: JK300 | **Bearing:** N/A | **Logged/Checked By:** K.S./O.F.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, structure, minor components.	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ EL .03 VL .1 L .3 M 1 H 3 VH 10 EH	DEFECT DETAILS DEFECT SPACING (mm) 500 300 100 50 30 10	DESCRIPTION Type, inclination, thickness, planarity, roughness, coating. Specific / General
100% RETURN		-4	14		SHALE: dark grey, with light grey lamiae, bedded at 0-5°. *(continued)*	FR	H			(14.12m) Be, 0°, P, S
		-5	15		END OF BOREHOLE AT 14.29 m					GOUNDWATER MONITORING WELL INSTALLED TO 11.5m, CLASS 18 MACHINE SLOTTED 50mm PVC STANDPIPE 8.5m TO 11.5m, CASING 0m TO 8.5m, 2mm SAND FILTER PACK 6.0m TO 1.2m, BENTONITE SEAL FROM 0.1m TO 6.0m, BACKFILLED WITH SAND TO SURFACE AND COMPLETED WITH A CONCRETED GATIC COVER
		-6	16							
		-7	17							
		-8	18							
		-9	19							

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 3
1 / 2

BOREHOLE LOG

Client: AUSTINO PROPERTY GROUP

Project: PROPOSED RESIDENTIAL DEVELOPMENT

Location: 2 MURRAY ROSE AVENUE, SYDNEY OLYMPIC PARK, NSW

Job No.: 30809YF **Method:** SPIRAL AUGER **R.L. Surface:** ~7.5 m

Date: 9/9/17 **Datum:** AHD

Plant Type: JK300 **Logged/Checked By:** A.C.K./O.F.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF AUGERING						7			-	ASPHALTIC CONCRETE: 50mm.t FILL: Silty gravelly clay, low plasticity, dark grey brown, light grey and orange brown, medium grained ironstone and shale gravel, trace of fine to coarse grained sand.	MC<PL			APPEARS WELL COMPACTED TOO FRIABLE FOR HP TESTING
					N = 21 12,12,9		1							
						6			CH	SILTY CLAY: high plasticity, light grey brown mottled orange brown, with medium to coarse grained ironstone and shale gravel.	MC<PL	(H)		RESIDUAL
					N > 16 4,9,7/ 100mm REFUSAL		2		-	SHALE: grey brown, with iron indurated bands.	XW	EL - VL		VERY LOW TO LOW 'TC' BIT RESISTANCE LOW RESISTANCE
						5	3							
ON COMPLETION OF CORING						4	4		-	SHALE: dark grey, with VL strength bands.	DW	L - M		LOW RESISTANCE WITH MODERATE BANDS
						3	5							
						2								
						1	6			REFER TO CORED BOREHOLE LOG				

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 3
2 / 2

CORED BOREHOLE LOG

Client: AUSTINO PROPERTY GROUP
Project: PROPOSED RESIDENTIAL DEVELOPMENT
Location: 2 MURRAY ROSE AVENUE, SYDNEY OLYMPIC PARK, NSW

Job No.: 30809YF | **Core Size:** NMLC | **R.L. Surface:** ~7.5 m
Date: 9/9/17 | **Inclination:** VERTICAL | **Datum:** AHD
Plant Type: JK300 | **Bearing:** N/A | **Logged/Checked By:** A.C.K./O.F.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, structure, minor components.	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ EL .03 / VL .1 / L .3 / M 1 / H 3 / VH 10 / EH	DEFECT DETAILS DEFECT SPACING (mm) 500 300 100 50 30 10	DESCRIPTION Type, inclination, thickness, planarity, roughness, coating. Specific / General
		2			START CORING AT 5.68m					
100% RETURN					CORE LOSS 0.22m					
		1	6		SHALE: dark grey, with light grey laminae, bedded at 0-5°.	DW	L - M			(5.93m) FRACTURED ZONE, 0°, 35mm.t (6.04m) J, 45°, P, S (6.12m) XWS, 0°, 4 mm.t (6.16m) XWS, 0°, 30 mm.t (6.29m) XWS, 0 - 20°, 5 mm.t (6.37m) FRACTURED ZONE, 0°, 55mm.t
		0	7							(6.51m) XWS, 0°, 70 mm.t (6.59m) XWS, 0°, 15 mm.t (6.65m) Cr, 0°, 30 mm.t (6.77m) J, 40°, Un, HEALED (6.86m) J, 35°, P, R (6.99m) J, 50°, P, S (7.12m) J, 50°, P, R (7.23m) J, 25°, P, HEALED (7.24m) J, 20°, P, HEALED (7.29m) J x 2, 40°, P, S
		-1	8			FR	M			
		-2	9				H			(8.52m) Fr, 0°, 260mm.t (9.08m) J, 40°, P, R
		-3	10							(10.71m) J, 80°, P, R
		-4	11		END OF BOREHOLE AT 10.75 m					

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 4
1 / 2

BOREHOLE LOG

Client: AUSTINO PROPERTY GROUP
Project: PROPOSED RESIDENTIAL DEVELOPMENT
Location: 2 MURRAY ROSE AVENUE, SYDNEY OLYMPIC PARK, NSW

Job No.: 30809YF **Method:** SPIRAL AUGER **R.L. Surface:** ~7.8 m
Date: 9/9/17 **Datum:** AHD
Plant Type: JK300 **Logged/Checked By:** A.C.K./O.F.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF AUGERING									-	ASPHALTIC CONCRETE: 50mm.t	D			
										FILL: Silty sandy gravel, medium to coarse grained, igneous, grey brown, fine grained sand.	MC>PL			
					N=SPT 5/ 150mm REFUSAL	7	1			FILL: Silty clay, medium to high plasticity, brown mottled light grey, dark grey and orange brown, trace of medium grained ironstone gravel.			220 220	
									CH	SILTY CLAY: high plasticity, light grey and orange brown, trace of medium grained ironstone gravel.	MC>PL	VS - H	380 500	RESIDUAL
					N > 16 8,16/ 150mm REFUSAL	6	2		-	SHALE: grey brown, with iron indurated bands.	XW	EL - VL		VERY LOW TO LOW 'TC' BIT RESISTANCE
						5	3			SHALE: dark grey, with iron indurated bands.	DW	L		LOW RESISTANCE
						4	4							LOW RESISTANCE WITH MODERATE BANDS
ON COMPLETION OF CORING						3	5			SHALE: dark grey.		L - M		
						2	6			REFER TO CORED BOREHOLE LOG				
						1								

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 4
2 / 2

CORED BOREHOLE LOG

Client: AUSTINO PROPERTY GROUP
Project: PROPOSED RESIDENTIAL DEVELOPMENT
Location: 2 MURRAY ROSE AVENUE, SYDNEY OLYMPIC PARK, NSW

Job No.: 30809YF | **Core Size:** NMLC | **R.L. Surface:** ~7.8 m
Date: 9/9/17 | **Inclination:** VERTICAL | **Datum:** AHD
Plant Type: JK300 | **Bearing:** N/A | **Logged/Checked By:** A.C.K./O.F.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, structure, minor components.	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ EL .03 VL .1 L .3 M 1 H 3 VH 10 EH	DEFECT SPACING (mm) 500 300 100 50 30 10	DEFECT DETAILS DESCRIPTION Type, inclination, thickness, planarity, roughness, coating. Specific / General
					START CORING AT 5.77m					GROUNDWATER MONITORING WELL INSTALLED TO 11.26m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 5.26m TO 11.26m. CASING 0m TO 5.26m. 2mm SAND FILTER PACK 1.9m TO 11.26m. BENTONITE SEAL 0m TO 1.9m. BACKFILLED WITH SAND TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.
19/09/17		2	6		CORE LOSS 0.45m					
		1	7		SHALE: dark grey, with iron indurated bands.	DW	M			(6.22m - 7.28m) HIGHLY FRACTURED ZONE
					CORE LOSS 0.05m	DW	L - M			(7.35m) Fr, 20°, 40mm.t
		0	8		SHALE: dark grey, with light grey laminae, bedded at 5-15°.	SW	M - H			(7.45m) XWS, 0°, 10 mm.t (7.47m) XWS, 0°, 45 mm.t (7.52m) J, 40°, P, R (7.89m) J, 60°, P, R (8.23m) XWS, 20°, 15 mm.t
100% RETURN		-1	9			FR	H - VH			
		-2	10							
		-3	11							(10.71m) J, 15°, Un, S (10.75m) J, 20°, P, S (10.82m) J, 50°, P, S (10.97m) J, 40°, P, S (11.12m) J, 45°, P, S (11.19m) J, 30°, Un, R
		-4			END OF BOREHOLE AT 11.26 m					

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

ENVIRONMENTAL LOG

Borehole No. **5** **1/1**

Environmental logs are not to be used for geotechnical purposes

Client: AUSTINO PROPERTY GROUP

Project: PROPOSED RESIDENTIAL DEVELOPMENT

Location: 2 MURRAY ROSE AVENUE, SYDNEY OLYMPIC PARK, NSW

Job No. E30809K **Method:** EZIPROBE **R.L. Surface:** N/A

Date: 4-9-17 **Datum:**

Logged/Checked by: H.L./R.M.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■		■				0			FILL: Gravelly silty clay, low to medium plasticity, brown, with fine to coarse grained igneous gravel, trace of ash.	MC≥PL			
	■		■							FILL: Silty clay, low to medium plasticity, brown, trace of fine to coarse grained sandstone gravel and glass fragments.	MC≤PL			
	■						1		CL-CH	SILTY CLAY: medium to high plasticity, brown, with shale bands.	MC<PL			
										END OF BOREHOLE AT 1.5m				
							2							
							3							
							4							
							5							
							6							
							7							

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

ENVIRONMENTAL LOG

Borehole No. **6** **1/1**

Environmental logs are not to be used for geotechnical purposes

Client: AUSTINO PROPERTY GROUP

Project: PROPOSED RESIDENTIAL DEVELOPMENT

Location: 2 MURRAY ROSE AVENUE, SYDNEY OLYMPIC PARK, NSW

Job No. E30809K **Method:** EZIPROBE **R.L. Surface:** N/A

Date: 4-9-17 **Datum:**

Logged/Checked by: H.L./R.M.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■		■				0			FILL: Gravelly silty clay, low to medium plasticity, with fine to coarse grained igneous gravel, trace of ash and glass fragments.	MC≥PL			GRAVEL COVER
	■		■				1			FILL: Silty clay, low to medium plasticity, dark brown, trace of ash, fine to coarse grained igneous gravel and glass fragments.	MC≤PL			
	■								CL-CH	SILTY CLAY: medium to high plasticity, grey mottled red brown, trace of fine to coarse grained ironstone gravel.	MC<PL			
	■						2		-	SHALE: grey brown.	DW			
										END OF BOREHOLE AT 2.3m				EZIBROBE REFUSAL ON INFERRED SHALE BEDROCK
							3							
							4							
							5							
							6							
							7							

EXPLANATORY NOTES – ENVIRONMENTAL LOGS

INTRODUCTION

These notes have been provided to supplement the environmental report with regards to drilling and field logging. Not all notes are necessarily relevant to all reports. Where geotechnical borehole logs are utilised for environmental purpose, reference should also be made to the explanatory notes included in the geotechnical report. Environmental logs are not suitable for geotechnical purposes.

The ground is a product of continuing natural and manmade processes and therefore exhibits a variety of characteristics and properties which vary from place to place and can change with time. Environmental studies involve gathering and assimilating limited facts about these characteristics and properties in order to understand the ground on a particular site under certain conditions. These conditions are directly relevant only to the ground at the place where, and time when, the investigation was carried out.

DESCRIPTION AND CLASSIFICATION METHODS

The methods of description and classification of soils and rocks used in this report are based on Australian Standard 1726, the SAA Site Investigation Code. In general, descriptions cover the following properties – soil or rock type, colour, structure, strength or density, and inclusions. Identification and classification of soil and rock involves judgement and the Company infers accuracy only to the extent that is common in current geotechnical practice.

Soil types are described according to the predominating particle size and behaviour as set out in the attached Unified Soil Classification Table qualified by the grading of other particles present (e.g. sandy clay) as set out below (note that unless stated in the report, the soil classification is based on a qualitative field assessment, not laboratory testing):

Soil Classification	Particle Size
Clay	less than 0.002mm
Silt	0.002 to 0.075mm
Sand	0.075 to 2mm
Gravel	2 to 60mm

Non-cohesive soils are classified on the basis of relative density, generally from the results of Standard Penetration Test (SPT) as below:

Relative Density	SPT 'N' Value (blows/300mm)
Very loose	less than 4
Loose	4 – 10
Medium dense	10 – 30
Dense	30 – 50
Very Dense	greater than 50

Cohesive soils are classified on the basis of strength (consistency) either by use of hand penetrometer, laboratory testing or engineering examination. The strength terms are defined as shown in the following table:

Classification	Unconfined Compressive Strength kPa
Very Soft	less than 25
Soft	25 – 50
Firm	50 – 100
Stiff	100 – 200
Very Stiff	200 – 400
Hard	Greater than 400
Friable	Strength not attainable – soil crumbles

Rock types are classified by their geological names, together with descriptive terms regarding weathering, strength, defects, etc. Where relevant, further information regarding rock classification is given in the text of the report. In the Sydney Basin, 'Shale' is used to describe thinly bedded to laminated siltstone.

DRILLING OR EXCAVATION METHODS

The following is a brief summary of drilling and excavation methods currently adopted by the Company, and some comments on their use and application. All except test pits and hand auger drilling require the use of a mechanical drilling rig.

Test Pits: These are normally excavated with a backhoe or a tracked excavator, allowing close examination of the in-situ soils if it is safe to descend into the pit. The depth of penetration is limited to approximately 3m for a backhoe and up to 6m for an excavator. Limitations of test pits include problems associated with disturbance and difficulty of reinstatement; and the consequent effects on nearby structures. Care must be taken if construction is to be carried out near test pit locations to either properly re-compact the backfill during construction, or to design and construct the structure so as not to be adversely affected by poorly compacted backfill at the test pit location.

Hand Auger Drilling: A borehole of 50mm to 100mm diameter is advanced by manually operated equipment. Premature refusal of the hand augers can occur on a variety of materials such as fill, hard clay, gravel or ironstone, and does not necessarily indicate rock level.

Continuous Spiral Flight Augers: The borehole is advanced using 75mm to 115mm diameter continuous spiral flight augers, which are withdrawn at intervals to allow sampling and in-situ testing. This is a relatively economical means of drilling in clays and in sands above the water table. Samples are returned to the surface by the flights or may be collected after withdrawal of the auger flights, but they can be very disturbed and layers may become mixed. Information from the auger sampling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively lower reliability due to mixing or softening of samples by groundwater, or uncertainties as to the original depth of the samples. Augering below the groundwater table is of even lesser reliability than augering above the water table.

Rock Augering: Use can be made of a Tungsten Carbide (TC) bit for auger drilling into rock to indicate rock quality and continuity by variation in drilling resistance and from examination of recovered rock fragments. This method of investigation is quick and relatively inexpensive but provides only an indication of the likely rock strength and predicted values may be in error by a strength order. Where rock strengths may have a significant impact on construction feasibility or costs, then further investigation by means of cored boreholes may be warranted.

Wash Boring: The borehole is usually advanced by a rotary bit, with water being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from "feel" and rate of penetration.

Mud Stabilised Drilling: Either Wash Boring or Continuous Core Drilling can use drilling mud as a circulating fluid to stabilise the borehole. The term 'mud' encompasses a range of products ranging from bentonite to polymers such as Revert or Biogel. The mud tends to mask the cuttings and reliable identification is only possible from intermittent intact sampling (e.g. from SPT and U50 samples) or from rock coring, etc.

Continuous Core Drilling: A continuous core sample is obtained using a diamond tipped core barrel. Provided full core recovery is achieved (which is not always possible in very low strength rocks and granular soils), this technique provides a very reliable (but relatively expensive) method of investigation. In rocks, an NMLC triple tube core barrel, which gives a core of about 50mm diameter, is usually used with water flush. The length of core recovered is compared to the length drilled and any length not recovered is shown as CORE LOSS. The locations of losses are determined on site by the supervising engineer; where the location is uncertain, the loss is placed at the top end of the drill run.

Standard Penetration Tests: Standard Penetration Tests (SPT) are used mainly in non-cohesive soils, but can also be used in cohesive soils as a means of indicating density or strength and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289, "Methods of Testing Soils for Engineering Purposes" – Test F3.1.

The test is carried out in a borehole by driving a 50mm diameter split sample tube with a tapered shoe, under the impact of a 63kg hammer with a free fall of 760mm. It is normal for the tube to be driven in three successive 150mm increments and the 'N' value is taken as the number of blows for the last 300mm. In dense sands, very hard clays or weak rock, the full 450mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form:

- In the case where full penetration is obtained with successive blow counts for each 150mm of, say, 4, 6 and 7 blows, as: N = 13 (4, 6, 7)
- In a case where the test is discontinued short of full penetration, say after 15 blows for the first 150mm and 30 blows for the next 40mm, as: N>30 (15, 30/40mm)

The results of the test can be related empirically to the engineering properties of the soil. Occasionally, the drop hammer is used to drive 50mm diameter thin walled sample tubes (U50) in clays. In such circumstances, the test results are shown on the borehole logs in brackets.

A modification to the SPT test is where the same driving system is used with a solid 60 tipped steel cone of the same diameter as the SPT hollow sampler. The solid cone can be continuously driven for some distance in soft clays or loose sands, or may be used where damage would otherwise occur to the SPT. The results of this Solid Cone Penetration Test (SCPT) are shown as "Nc" on the borehole logs, together with the number of blows per 150mm penetration.

LOGS

The borehole or test pit logs presented herein are an interpretation of the subsurface conditions, and their reliability will depend to some extent on the frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will enable the most reliable assessment, but is not always practicable or possible to justify on economic grounds. In any case, the boreholes or test pits represent only a very small sample of the total subsurface conditions.

The attached explanatory notes define the terms and symbols used in preparation of the logs.

Interpretation of the information shown on the logs, and its application to design and construction, should therefore take into account the spacing of boreholes or test pits, the method of drilling or excavation, the frequency of sampling and testing and the possibility of other than "straight line"

variations between the boreholes or test pits. Subsurface conditions between boreholes or test pits may vary significantly from conditions encountered at the borehole or test pit locations.

GROUNDWATER

Where groundwater levels are measured in boreholes, there are several potential problems:

- Although groundwater may be present, in low permeability soils it may enter the hole slowly or perhaps not at all during the time it is left open;
- A localised perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes and may not be the same at the time of construction; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must be washed out of the hole or 'reverted' chemically if water observations are to be made.

More reliable measurements can be made by installing standpipes which are read after stabilising at intervals ranging from several days to perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from perched water tables or surface water.

FILL

The presence of fill materials can often be determined only by the inclusion of foreign objects (e.g. bricks, concrete, plastic, slag/ash, steel etc) or by distinctly unusual colour, texture or fabric. Identification of the extent of fill materials will also depend on investigation methods and frequency. Where natural soils similar to those at the site are used for fill, it may be difficult with limited testing and sampling to reliably determine the extent of the fill.

The presence of fill materials is usually regarded with caution as the possible variation in density, strength and material type is much greater than with natural soil deposits. If the volume and quality of fill is of importance to a project, then frequent test pit excavations are preferable to boreholes

LABORATORY TESTING

Laboratory testing has not been undertaken to confirm the soil classifications and rocks strengths indicated on the environmental logs unless noted in the report.

SITE ANOMALIES

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, EIS should be notified immediately.

GRAPHIC LOG SYMBOLS FOR SOIL AND ROCKS

SOIL


FILL


TOPSOIL


CLAY (CL, CH)


SILT (ML, MH)


SAND (SP, SW)


GRAVEL (GP, GW)


SANDY CLAY (CL, CH)


SILTY CLAY (CL, CH)


CLAYEY SAND (SC)


SILTY SAND (SM)


GRAVELLY CLAY (CL, CH)


CLAYEY GRAVEL (GC)


SANDY SILT (ML)


PEAT AND ORGANIC SOILS

ROCK


CONGLOMERATE


SANDSTONE


SHALE


SILTSTONE, MUDSTONE, CLAYSTONE


LIMESTONE


PHYLLITE, SCHIST


TUFF


GRANITE, GABBRO


DOLERITE, DIORITE


BASALT, ANDESITE


QUARTZITE

DEFECTS AND INCLUSIONS


CLAY SEAM


SHEARED OR CRUSHED SEAM


BRECCIATED OR SHATTERED SEAM/ZONE


IRONSTONE GRAVEL


ORGANIC MATERIAL

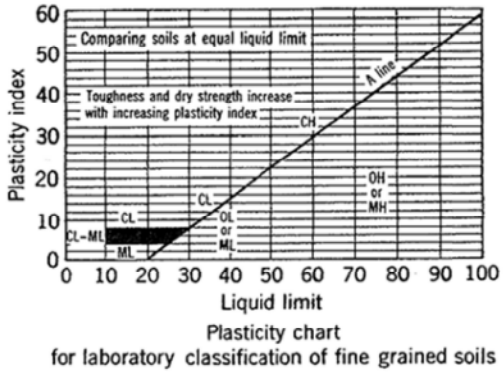
OTHER MATERIALS


CONCRETE


BITUMINOUS CONCRETE, COAL


COLLUVIUM

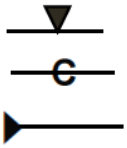
Field Identification Procedures (Excluding particles larger than 75 μm and basing fractions on estimated weights)						Group Symbols [a]	Typical Names	Information Required for Describing Soils	Laboratory Classification Criteria
Coarse-grained soils More than half of material is *larger* than 75 μm sieve size[b] (The 75 μm sieve size is about the smallest particle visible to naked eye)	Gravels More than half of coarse fraction is larger than 4 mm sieve size	Clean gravels (little or no fines)	Wide range in grain size and substantial amounts of all intermediate particle sizes			*GW*	Well graded gravels, gravel-sand mixtures, little or no fines	Give typical name; indicate approximate percentages of sand and gravel; maximum size; angularity, surface condition, and hardness of the coarse grains; local or geologic name and other pertinent descriptive information; and symbols in parentheses For undisturbed soils add information on stratification, degree of compactness, cementation, moisture conditions and drainage characteristics Example: *Silty sand*, gravelly; about 20% hard, angular gravel particles 12 mm maximum size; rounded and subangular sand grains coarse to fine, about 15% non-plastic fines with low dry strength; well compacted and moist in place; alluvial sand; (*SM*)	Use grain size curve in identifying the fractions as given under field identification Determine percentages of gravel and sand from grain size curve Depending on percentage of fines (fraction smaller than 75 μm sieve size) coarse grained soils are classified as follows: Less than 5% *GW, GP, SW, SP* More than 12% *GM, GC, SM, SC* 5% to 12% *Borderline* cases requiring use of dual symbols $C_U = \frac{D_{60}}{D_{10}}$ Greater than 4 $C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3 Not meeting all gradation requirements for *GW* Atterberg limits below "A" line, or *PI* less than 4 — Above "A" line with *PI* between 4 and 7 are *borderline* cases requiring use of dual symbols Atterberg limits above "A" line, with *PI* greater than 7
			Predominantly one size or a range of sizes with some intermediate sizes missing			*GP*	Poorly graded gravels, gravel-sand mixtures, little or no fines		
		Gravels with fines (appreciable amount of fines)	Nonplastic fines (for identification procedures see *ML* below)			*GM*	Silty gravels, poorly graded gravel-sand-silt mixtures		
			Plastic fines (for identification procedures, see *CL* below)			*GC*	Clayey gravels, poorly graded gravel-sand-clay mixtures		
	Sands More than half of coarse fraction is smaller than 4 mm sieve size	Clean sands (little or no fines)	Wide range in grain sizes and substantial amounts of all intermediate particle sizes			*SW*	Well graded sands, gravelly sands, little or no fines		$C_U = \frac{D_{60}}{D_{10}}$ Greater than 6 $C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3 Not meeting all gradation requirements for *SW* Atterberg limits below "A" line or *PI* less than 5 — Above "A" line with *PI* between 4 and 7 are *borderline* cases requiring use of dual symbols Atterberg limits below "A" line with *PI* greater than 7
			Predominantly one size or a range of sizes with some intermediate sizes missing			*SP*	Poorly graded sands, gravelly sands, little or no fines		
		Sands with fines (appreciable amount of fines)	Nonplastic fines (for identification procedures, see *ML* below)			*SM*	Silty sands, poorly graded sand-silt mixtures		
			Plastic fines (for identification procedures, see *CL* below)			*SC*	Clayey sands, poorly graded sand-clay mixtures		
Fine-grained soils More than half of material is *smaller* than 75 μm sieve size	Identification Procedures on Fraction Smaller than 380 μm Sieve Size		Dry Strength (crushing characteristics)	Dilatancy (reaction to shaking)	Toughness (consistency near plastic limit)				
	Silts and clays liquid limit less than 50		None to slight	Quick to slow	None	*ML*	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands with slight plasticity	Give typical name; indicate degree and character of plasticity, amount and maximum size of coarse grains; colour in wet condition, odour if any, local or geologic name, and other pertinent descriptive information, and symbol in parentheses For undisturbed soils add information on structure, stratification, consistency in undisturbed and remoulded states, moisture and drainage conditions Example: *Clayey silt*, brown; slightly plastic; small percentage of fine sand; numerous vertical root holes; firm and dry in place; loess; (*ML*)	
			Medium to high	None to very slow	Medium	*CL*	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays		
			Slight to medium	Slow	Slight	*OL*	Organic silts and organic silt-clays of low plasticity		
	Silts and clays liquid limit greater than 50		Slight to medium	Slow to none	Slight to medium	*MH*	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts		
			High to very high	None	High	*CH*	Inorganic clays of high plasticity, fat clays		
			Medium to high	None to very slow	Slight to medium	*OH*	Organic clays of medium to high plasticity		
Highly Organic Soils			Readily identified by colour, odour, spongy feel and frequently by fibrous texture			*Pt*	Peat and other highly organic soils		



Plasticity chart
for laboratory classification of fine grained soils

Note: 1 Soils possessing characteristics of two groups are designated by combinations of group symbols (eg. GW-GC, well graded gravel-sand mixture with clay fines).
2 Soils with liquid limits of the order of 35 to 50 may be visually classified as being of medium plasticity.

LOG SYMBOLS

LOG COLUMN	SYMBOL	DEFINITION
Groundwater Record		Standing water level. Time delay following completion of drilling may be shown. Extent of borehole collapse shortly after drilling. Groundwater seepage into borehole or excavation noted during drilling or excavation.
Samples	ES U50 DB DS ASB ASS SAL	Soil sample taken over depth indicated, for environmental analysis. Undisturbed 50mm diameter tube sample taken over depth indicated. Bulk disturbed sample taken over depth indicated. Small disturbed bag sample taken over depth indicated. Soil sample taken over depth indicated, for asbestos screening. Soil sample taken over depth indicated, for acid sulfate soil analysis. Soil sample taken over depth indicated, for salinity analysis.
Field Tests	N = 17 4, 7, 10	Standard Penetration Test (SPT) performed between depths indicated by lines. Individual show blows per 150mm penetration. 'R' as noted below.
	N_c = 5 7 3 R	Solid Cone Penetration Test (SCPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration for 60 degree solid cone driven by SPT hammer. 'R' refers to apparent hammer refusal within the corresponding 150mm depth increment.
	VNS = 25 PID = 100	Vane shear reading in kPa of Undrained Shear Strength. Photoionisation detector reading in ppm (Soil sample heads pace test).
Moisture (Cohesive Soils) (Cohesionless)	MC > PL MC ≈ PL MC < PL D M W	Moisture content estimated to be greater than plastic limit. Moisture content estimated to be approximately equal to plastic limit. Moisture content estimated to be less than plastic limit. DRY – Runs freely through fingers. MOIST – Does not run freely but no free water visible on soil surface. WET – Free water visible on soil surface.
Strength (Consistency) Cohesive Soils	VS S F St VSt H ( )	VERY SOFT – Unconfined compressive strength less than 25kPa SOFT – Unconfined compressive strength 25-5 0kPa FIRM – Unconfined compressive strength 50-1 00kPa STIFF – Unconfined compressive strength 100- 200kPa VERY STIFF – Unconfined compressive strength 200- 400kPa HARD – Unconfined compressive strength greater than 400kPa Bracketed symbol indicates estimated consistency based o n tactile examination or other tests.
Density Index/ Relative Density (Cohesionless Soils)	VL L MD D VD ( )	**Density Index (ID) Range (%)** / **SPT ' N' Value Range (Blows/300mm)** Very Loose <15 / 0-4 Loose 15-35 / 4-10 Medium Dense 35-65 / 10-30 Dense 65-85 / 30-50 Very Dense >85 / >50 Bracketed symbol indicates estimated density based on ease of drilling or other tests.
Hand Penetrometer Readings	300 250	Numbers indicate individual test results in kPa on representative undisturbed material unless noted otherwise
Remarks	'V' bit 'TC' bit T_{60}	Hardened steel 'V' shaped bit. Tungsten carbide wing bit. Penetration of auger string in mm under static load of rig applied by drill head hydraulics without rotation of augers.

LOG SYMBOLS CONTINUED

ROCK STRENGTH

Rock strength is defined by the Point Load Strength Index (Is 50) and refers to the strength of the rock substance in the bedding. The test procedure is described by the International Journal of Rock Mechanics, Mining and Geomechanics Abstract Volume 22, No 2, 1985.

TERM	SYMBOL	Is (50) MPa	FIELD GUIDE
Extremely Low:	EL	0.03	Easily remoulded by hand to a material with soil properties.
Very Low:	VL	0.1	May be crumbled in the hand. Sandstone is "sugary" and friable.
Low:	L	0.3	A piece of core 150 mm long x 50mm dia. may be broken by hand and easily scored with a knife. Sharp edges of core may be friable and break during handling.
Medium Strength:	M	1	A piece of core 150 mm long x 50mm dia. can be broken by hand with difficulty. Readily scored with knife.
High:	H	3	A piece of core 150 mm long x 50mm dia. core cannot be broken by hand, can be slightly scratched or scored with knife; rock rings under hammer.
Very High:	VH	10	A piece of core 150 mm long x 50mm dia. may be broken with hand-held pick after more than one blow. Cannot be scratched with pen knife; rock rings under hammer.
Extremely High:	EH		A piece of core 150 mm long x 50mm dia. is very difficult to break with h and-held hammer . Rings when struck with a hammer.

ROCK STRENGTH

ABBREVIATION	DESCRIPTION	NOTES
Be	Bedding Plane Parting	Defect orientations measured relative to the normal to (i.e. relative to horizontal for vertical holes)
CS	Clay Seam	
J	Joint	
P	Planar	
Un	Undulating	
S	Smooth	
R	Rough	
IS	Iron stained	
XWS	Extremely Weathered Seam	
Cr	Crushed Seam	
60t	Thickness of defect in millimetres	

Appendix D: Laboratory Report/s & COC Documents

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD	EIS Job Number: E30809K	ENVIRONMENTAL INVESTIGATION SERVICES
12 ASHLEY STREET		REAR OF 115 WICKS ROAD
CHATSWOOD NSW 2067		MACQUARIE PARK, NSW 2113
P: (02) 99106200	Date Results Required: STANDARD	P: 02-9888 5000 F: 02-9888 5001
F: (02) 99106201		
Attention: Aileen	Page: 1 of 1	Attention: Harry Leonard

Location:	Sydney Olympic Park	Sample Preserved in Esky on Ice
Sampler:	HL	Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 6a	Combo 3	Combo 6	Combo 6a	8 Metals	PAHs	TRH/BTEX	BTEX	Asbestos			
4/09/2017	1	BH1	0-0.2	G, A	0.0	clay F	X											
	2	BH1	0.6-0.8	G,A	0.0	clay F												
	3	BH1	1.0-1.2	G	0.0	clay		X										
	4	BH2	0-0.2	G,A	0.0	clay F												
	5	BH2	0.9-1.1	G,A	0.0	clay F	X											
	6	BH2	1.3-1.5	G	0.0	clay												
	7	BH2	2.0-2.2	G	0.0	shale												

ENVIROLAB

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 175151

Date Received: 7/9/17

Time Received: 15:05

Received by: MT

Temp: (Cool)/Ambient 15.2

Cooling: Ice/Icepack

Security: (Intact)/Broken/None

Remarks (comments/detection limits required):	Sample Containers: G - 250mg Glass Jar A - Ziplock Asbestos Bag P - Plastic Bag

Relinquished By:	Date:	Time:	Received By:	Date:
M Lo	7/9/2017		EIS MT	7/9/17 15:05.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Environmental Investigation Services
Attention	Harry Leonard

Sample Login Details

Your reference	E30809K, Sydney Olympic Park
Envirolab Reference	175151
Date Sample Received	07/09/2017
Date Instructions Received	07/09/2017
Date Results Expected to be Reported	14/09/2017

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	7 Soils
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	15.2
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticidesin soil	Organophosphorus Pesticides	PCBsin Soil	Acid Extractable metalsin soil	Asbestos ID - soils	On Hold
BH1-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓	
BH1-0.6-0.8									✓
BH1-1.0-1.2	✓	✓	✓				✓		
BH2-0-0.2									✓
BH2-0.9-1.1	✓	✓	✓	✓	✓	✓	✓	✓	
BH2-1.3-1.5									✓
BH2-2.0-2.2									✓

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.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 175151

Client Details

Client	Environmental Investigation Services
Attention	Harry Leonard
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E30809K, Sydney Olympic Park**
Number of Samples	7 Soils
Date samples received	07/09/2017
Date completed instructions received	07/09/2017

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	14/09/2017
Date of Issue	14/09/2017

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

Asbestos Approved By
Analysed by Asbestos Approved Identifier: Matt Tang
Authorised by Asbestos Approved Signatory: Paul Ching

Results Approved By
Jeremy Faircloth, Organics Supervisor
Leon Ow, Chemist
Paul Ching, Senior Analyst
Steven Luong, Chemist

Authorised By

David Springer, General Manager

vTRH(C6-C10)/BTEXN in Soil				
Our Reference		175151-1	175151-3	175151-5
Your Reference	UNITS	BH5	BH5	BH6
Depth		0-0.2	1.0-1.2	0.9-1.1
Date Sampled		04/09/2017	04/09/2017	04/09/2017
Type of sample		Soil	Soil	Soil
Date extracted	-	11/09/2017	11/09/2017	11/09/2017
Date analysed	-	12/09/2017	12/09/2017	12/09/2017
TRH C_6 - C_9	mg/kg	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	125	95	121

svTRH (C10-C40) in Soil				
Our Reference		175151-1	175151-3	175151-5
Your Reference	UNITS	BH5	BH5	BH6
Depth		0-0.2	1.0-1.2	0.9-1.1
Date Sampled		04/09/2017	04/09/2017	04/09/2017
Type of sample		Soil	Soil	Soil
Date extracted	-	11/09/2017	11/09/2017	11/09/2017
Date analysed	-	12/09/2017	12/09/2017	12/09/2017
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50
Surrogate o-Terphenyl	%	79	81	80

PAHs in Soil				
Our Reference		175151-1	175151-3	175151-5
Your Reference	UNITS	BH5	BH5	BH6
Depth		0-0.2	1.0-1.2	0.9-1.1
Date Sampled		04/09/2017	04/09/2017	04/09/2017
Type of sample		Soil	Soil	Soil
Date extracted	-	11/09/2017	11/09/2017	11/09/2017
Date analysed	-	12/09/2017	12/09/2017	12/09/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.2	<0.1	0.2
Pyrene	mg/kg	0.2	<0.1	0.2
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1
Chrysene	mg/kg	0.2	<0.1	0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.3	<0.2	0.2
Benzo(a)pyrene	mg/kg	0.2	<0.05	0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.2	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	1.4	<0.05	0.80
Surrogate p-Terphenyl-d14	%	88	89	88

Organochlorine Pesticides in soil			
Our Reference		175151-1	175151-5
Your Reference	UNITS	BH5	BH6
Depth		0-0.2	0.9-1.1
Date Sampled		04/09/2017	04/09/2017
Type of sample		Soil	Soil
Date extracted	-	11/09/2017	11/09/2017
Date analysed	-	11/09/2017	11/09/2017
HCB	mg/kg	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1
Surrogate TCMX	%	73	73

Organophosphorus Pesticides			
Our Reference		175151-1	175151-5
Your Reference	UNITS	BH5	BH6
Depth		0-0.2	0.9-1.1
Date Sampled		04/09/2017	04/09/2017
Type of sample		Soil	Soil
Date extracted	-	11/09/2017	11/09/2017
Date analysed	-	11/09/2017	11/09/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1
Surrogate TCMX	%	73	73

PCBs in Soil			
Our Reference		175151-1	175151-5
Your Reference	UNITS	BH5	BH6
Depth		0-0.2	0.9-1.1
Date Sampled		04/09/2017	04/09/2017
Type of sample		Soil	Soil
Date extracted	-	11/09/2017	11/09/2017
Date analysed	-	11/09/2017	11/09/2017
Aroclor 1016	mg/kg	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1
Surrogate TCLMX	%	73	73

Acid Extractable metals in soil				
Our Reference		175151-1	175151-3	175151-5
Your Reference	UNITS	BH5	BH5	BH6
Depth		0-0.2	1.0-1.2	0.9-1.1
Date Sampled		04/09/2017	04/09/2017	04/09/2017
Type of sample		Soil	Soil	Soil
Date prepared	-	11/09/2017	11/09/2017	11/09/2017
Date analysed	-	11/09/2017	11/09/2017	11/09/2017
Arsenic	mg/kg	9	5	18
Cadmium	mg/kg	<0.4	<0.4	<0.4
Chromium	mg/kg	14	22	13
Copper	mg/kg	31	21	34
Lead	mg/kg	21	24	34
Mercury	mg/kg	<0.1	<0.1	<0.1
Nickel	mg/kg	35	7	6
Zinc	mg/kg	57	15	27

Moisture				
Our Reference		175151-1	175151-3	175151-5
Your Reference	UNITS	BH5	BH5	BH6
Depth		0-0.2	1.0-1.2	0.9-1.1
Date Sampled		04/09/2017	04/09/2017	04/09/2017
Type of sample		Soil	Soil	Soil
Date prepared	-	11/09/2017	11/09/2017	11/09/2017
Date analysed	-	12/09/2017	12/09/2017	12/09/2017
Moisture	%	10	19	17

Asbestos ID - soils			
Our Reference		175151-1	175151-5
Your Reference	UNITS	BH5	BH6
Depth		0-0.2	0.9-1.1
Date Sampled		04/09/2017	04/09/2017
Type of sample		Soil	Soil
Date analysed	-	14/09/2017	14/09/2017
Sample mass tested	g	Approx. 35g	Approx. 25g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	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.
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-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. Note, 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-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. 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-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.

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-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.
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.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			11/09/2017	[NT]	[NT]	[NT]	[NT]	11/09/2017	[NT]
Date analysed	-			12/09/2017	[NT]	[NT]	[NT]	[NT]	12/09/2017	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	110	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	110	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	[NT]	[NT]	118	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	[NT]	[NT]	121	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	108	[NT]
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	109	[NT]	[NT]	[NT]	[NT]	114	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			11/09/2017	[NT]	[NT]	[NT]	[NT]	11/09/2017	[NT]
Date analysed	-			11/09/2017	[NT]	[NT]	[NT]	[NT]	11/09/2017	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	81	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	78	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	121	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	81	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	78	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	121	[NT]
Surrogate o-Terphenyl	%		Org-003	117	[NT]	[NT]	[NT]	[NT]	90	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			11/09/2017	[NT]	[NT]	[NT]	[NT]	11/09/2017	[NT]
Date analysed	-			12/09/2017	[NT]	[NT]	[NT]	[NT]	12/09/2017	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	[NT]	[NT]	[NT]	[NT]	104	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	83	[NT]	[NT]	[NT]	[NT]	114	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			11/09/2017	[NT]	[NT]	[NT]	[NT]	11/09/2017	[NT]
Date analysed	-			11/09/2017	[NT]	[NT]	[NT]	[NT]	11/09/2017	[NT]
HCB	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	91	[NT]
gamma-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Heptachlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	89	[NT]
delta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Dieldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Endrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	85	[NT]
pp-DDD	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Endosulfan II	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Methoxychlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-005	84	[NT]	[NT]	[NT]	[NT]	115	[NT]

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			11/09/2017	[NT]	[NT]	[NT]	[NT]	11/09/2017	[NT]
Date analysed	-			11/09/2017	[NT]	[NT]	[NT]	[NT]	11/09/2017	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	68	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Dimethoate	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Fenitrothion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	75	[NT]
Malathion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	79	[NT]
Parathion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	74	[NT]
Ronnel	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	81	[NT]
Surrogate TCMX	%		Org-008	84	[NT]	[NT]	[NT]	[NT]	75	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			11/09/2017	[NT]	[NT]	[NT]	[NT]	11/09/2017	[NT]
Date analysed	-			11/09/2017	[NT]	[NT]	[NT]	[NT]	11/09/2017	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCLMX	%		Org-006	84	[NT]	[NT]	[NT]	[NT]	75	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			11/09/2017	[NT]	[NT]	[NT]	[NT]	11/09/2017	[NT]
Date analysed	-			11/09/2017	[NT]	[NT]	[NT]	[NT]	11/09/2017	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	105	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	102	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	103	[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: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

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.

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD	EIS Job Number: E30809K	ENVIRONMENTAL INVESTIGATION SERVICES
12 ASHLEY STREET		REAR OF 115 WICKS ROAD
CHATSWOOD NSW 2067	Date Results Required: STANDARD	MACQUARIE PARK, NSW 2113
P: (02) 99106200		P: 02-9888 5000 F: 02-9888 5001
F: (02) 99106201	Page: 1 of 1	Attention: Harry Leonard
Attention: Aileen		

Location:	Sydney Olympic Park	Sample Preserved in Esky on Ice
Sampler:	HL	Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 6a	Combo 3	Combo 6	Combo 6a	8 Metals	PAHs	TRH/BTEX	BTEX	Asbestos			
9/9/17	1	BH1	0-0.1	G, A	0.0	soil												
	2	BH1	0.8-1.0	G,A	0.0	soil	X											
	3	BH1	1.5-1.95	G,A	0.0	soil												
	4	BH2	0.05-0.1	G,A	0.0	soil	X											
	5	BH2	0.8-1.0	G,A	0.0	soil												
	6	BH2	1.5-1.95	G,A	0.0	soil												
	7	BH3	0.1-0.2	G,A	0.0	soil	X											
	8	BH3	0.5-0.95	G,A	0.0	soil												
	9	BH3	1.5-1.8	G,A	0.0	soil		X										
	10	BH4	0.1-0.2	G,A	0.0	soil												
	11	BH4	0.5-0.65	G,A	0.0	soil	X											
	12	BH4	1.3-1.5	G,A	0.0	soil		X										

ENVIROLAB GROUP

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 175381

Date Received: 12/9/2017

Time Received: 10.05

Received by: PR

Temp: Cool/Ambient

Cooling: Ice/Icepack

Security: Intact/Broken/None

12-9

Remarks (comments/detection limits required):

Sample Containers:
G - 250mg Glass Jar
A - Ziplock Asbestos Bag
P - Plastic Bag

Relinquished By:	Date:	Time:	Received By:	Date:
		10.05	PR	12/9

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Environmental Investigation Services
Attention	Harry Leonard

Sample Login Details

Your reference	E30809K, Sydney Olympic Park
Envirolab Reference	175381
Date Sample Received	12/09/2017
Date Instructions Received	12/09/2017
Date Results Expected to be Reported	19/09/2017

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	12 SOIL
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	12.9
Cooling Method	Na
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticidesin soil	Organophosphorus Pesticides	PCBsin Soil	Acid Extractable metalsin soil	Asbestos ID - soils	On Hold
BH1-0-0.1									✓
BH1-0.8-1.0	✓	✓	✓	✓	✓	✓	✓	✓	
BH1-1.5-1.9									✓
BH2-0.05-0.1	✓	✓	✓	✓	✓	✓	✓	✓	
BH2-0.8-1.0									✓
BH2-1.5-1.95									✓
BH3-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓	
BH3-0.5-0.95									✓
BH3-1.5-1.8	✓	✓	✓				✓		
BH4-0.1-0.2									✓
BH4-0.5-0.65	✓	✓	✓	✓	✓	✓	✓	✓	
BH4-1.3-1.5	✓	✓	✓				✓		

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.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 175381

Client Details

Client	Environmental Investigation Services
Attention	Harry Leonard
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E30809K, Sydney Olympic Park**
Number of Samples	12 SOIL
Date samples received	12/09/2017
Date completed instructions received	12/09/2017

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	19/09/2017
Date of Issue	18/09/2017

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

Report Comments

Asbestos: Excessive sample volume was provided for asbestos analysis. A portion of the supplied sample was sub-sampled according to Envirolab procedures. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g (50mL) of sample in its own container as per AS4964-2004.
Note: Samples 175381-2, 4, 7 were sub-sampled from bags provided by the client.

Asbestos Approved By
Analysed by Asbestos Approved Identifier: Lucy Zhu
Authorised by Asbestos Approved Signatory: Paul Ching

Results Approved By
Giovanni Agosti, Group Technical Manager
Jeremy Faircloth, Organics Supervisor
Paul Ching, Senior Analyst
Steven Luong, Chemist

Authorised By

David Springer, General Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		175381-2	175381-4	175381-7	175381-9	175381-11
Your Reference	UNITS	BH1	BH2	BH3	BH3	BH4
Depth		0.8-1.0	0.05-0.1	0.1-0.2	1.5-1.8	0.5-0.65
Date Sampled		09/09/2017	09/09/2017	09/09/2017	09/09/2017	09/09/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	13/09/2017	13/09/2017	13/09/2017	13/09/2017	13/09/2017
Date analysed	-	13/09/2017	13/09/2017	13/09/2017	13/09/2017	13/09/2017
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH 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
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	100	83	106	86	84

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		175381-12
Your Reference	UNITS	BH4
Depth		1.3-1.5
Date Sampled		09/09/2017
Type of sample		SOIL
Date extracted	-	13/09/2017
Date analysed	-	13/09/2017
TRH C_6 - C_9	mg/kg	<25
TRH C_6 - C_{10}	mg/kg	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
naphthalene	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	81

svTRH (C10-C40) in Soil						
Our Reference		175381-2	175381-4	175381-7	175381-9	175381-11
Your Reference	UNITS	BH1	BH2	BH3	BH3	BH4
Depth		0.8-1.0	0.05-0.1	0.1-0.2	1.5-1.8	0.5-0.65
Date Sampled		09/09/2017	09/09/2017	09/09/2017	09/09/2017	09/09/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	13/09/2017	13/09/2017	13/09/2017	13/09/2017	13/09/2017
Date analysed	-	13/09/2017	13/09/2017	13/09/2017	13/09/2017	13/09/2017
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
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	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	87	87	88	89	86

svTRH (C10-C40) in Soil		
Our Reference		175381-12
Your Reference	UNITS	BH4
Depth		1.3-1.5
Date Sampled		09/09/2017
Type of sample		SOIL
Date extracted	-	13/09/2017
Date analysed	-	13/09/2017
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	<100
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	<100
TRH >C_{34} -C_{40}	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	88

PAHs in Soil						
Our Reference		175381-2	175381-4	175381-7	175381-9	175381-11
Your Reference	UNITS	BH1	BH2	BH3	BH3	BH4
Depth		0.8-1.0	0.05-0.1	0.1-0.2	1.5-1.8	0.5-0.65
Date Sampled		09/09/2017	09/09/2017	09/09/2017	09/09/2017	09/09/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	13/09/2017	13/09/2017	13/09/2017	13/09/2017	13/09/2017
Date analysed	-	13/09/2017	13/09/2017	13/09/2017	13/09/2017	13/09/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.2	<0.1	<0.1	<0.1	0.2
Pyrene	mg/kg	0.2	<0.1	<0.1	0.1	0.3
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	0.2
Chrysene	mg/kg	0.1	<0.1	<0.1	<0.1	0.2
Benzo(b,j+k)fluoranthene	mg/kg	0.2	<0.2	<0.2	<0.2	0.6
Benzo(a)pyrene	mg/kg	0.1	<0.05	<0.05	0.06	0.3
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.3
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	0.90	<0.05	<0.05	0.2	2.3
Surrogate p-Terphenyl-d14	%	88	92	90	90	86

PAHs in Soil		
Our Reference		175381-12
Your Reference	UNITS	BH4
Depth		1.3-1.5
Date Sampled		09/09/2017
Type of sample		SOIL
Date extracted	-	13/09/2017
Date analysed	-	13/09/2017
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	0.2
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	0.2
Pyrene	mg/kg	0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Total +ve PAH's	mg/kg	0.4
Surrogate p-Terphenyl-d14	%	90

Organochlorine Pesticides in soil					
Our Reference		175381-2	175381-4	175381-7	175381-11
Your Reference	UNITS	BH1	BH2	BH3	BH4
Depth		0.8-1.0	0.05-0.1	0.1-0.2	0.5-0.65
Date Sampled		09/09/2017	09/09/2017	09/09/2017	09/09/2017
Type of sample		SOIL	SOIL	SOIL	SOIL
Date extracted	-	13/09/2017	13/09/2017	13/09/2017	13/09/2017
Date analysed	-	13/09/2017	13/09/2017	13/09/2017	13/09/2017
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	92	90	90	96

Organophosphorus Pesticides					
Our Reference		175381-2	175381-4	175381-7	175381-11
Your Reference	UNITS	BH1	BH2	BH3	BH4
Depth		0.8-1.0	0.05-0.1	0.1-0.2	0.5-0.65
Date Sampled		09/09/2017	09/09/2017	09/09/2017	09/09/2017
Type of sample		SOIL	SOIL	SOIL	SOIL
Date extracted	-	13/09/2017	13/09/2017	13/09/2017	13/09/2017
Date analysed	-	13/09/2017	13/09/2017	13/09/2017	13/09/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	92	90	90	96

PCBs in Soil					
Our Reference		175381-2	175381-4	175381-7	175381-11
Your Reference	UNITS	BH1	BH2	BH3	BH4
Depth		0.8-1.0	0.05-0.1	0.1-0.2	0.5-0.65
Date Sampled		09/09/2017	09/09/2017	09/09/2017	09/09/2017
Type of sample		SOIL	SOIL	SOIL	SOIL
Date extracted	-	13/09/2017	13/09/2017	13/09/2017	13/09/2017
Date analysed	-	13/09/2017	13/09/2017	13/09/2017	13/09/2017
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	92	90	90	96

Acid Extractable metals in soil						
Our Reference		175381-2	175381-4	175381-7	175381-9	175381-11
Your Reference	UNITS	BH1	BH2	BH3	BH3	BH4
Depth		0.8-1.0	0.05-0.1	0.1-0.2	1.5-1.8	0.5-0.65
Date Sampled		09/09/2017	09/09/2017	09/09/2017	09/09/2017	09/09/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	13/09/2017	13/09/2017	13/09/2017	13/09/2017	13/09/2017
Date analysed	-	13/09/2017	13/09/2017	13/09/2017	13/09/2017	13/09/2017
Arsenic	mg/kg	7	<4	<4	20	9
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	13	12	11	10	16
Copper	mg/kg	28	58	58	46	39
Lead	mg/kg	18	2	2	43	19
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	11	100	110	11	28
Zinc	mg/kg	31	35	35	50	39

Acid Extractable metals in soil		
Our Reference		175381-12
Your Reference	UNITS	BH4
Depth		1.3-1.5
Date Sampled		09/09/2017
Type of sample		SOIL
Date prepared	-	13/09/2017
Date analysed	-	13/09/2017
Arsenic	mg/kg	9
Cadmium	mg/kg	<0.4
Chromium	mg/kg	18
Copper	mg/kg	45
Lead	mg/kg	24
Mercury	mg/kg	<0.1
Nickel	mg/kg	4
Zinc	mg/kg	15

Moisture						
Our Reference		175381-2	175381-4	175381-7	175381-9	175381-11
Your Reference	UNITS	BH1	BH2	BH3	BH3	BH4
Depth		0.8-1.0	0.05-0.1	0.1-0.2	1.5-1.8	0.5-0.65
Date Sampled		09/09/2017	09/09/2017	09/09/2017	09/09/2017	09/09/2017
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	13/09/2017	13/09/2017	13/09/2017	13/09/2017	13/09/2017
Date analysed	-	14/09/2017	14/09/2017	14/09/2017	14/09/2017	14/09/2017
Moisture	%	15	8.1	4.7	9.8	18

Moisture		
Our Reference		175381-12
Your Reference	UNITS	BH4
Depth		1.3-1.5
Date Sampled		09/09/2017
Type of sample		SOIL
Date prepared	-	13/09/2017
Date analysed	-	14/09/2017
Moisture	%	22

Asbestos ID - soils					
Our Reference		175381-2	175381-4	175381-7	175381-11
Your Reference	UNITS	BH1	BH2	BH3	BH4
Depth		0.8-1.0	0.05-0.1	0.1-0.2	0.5-0.65
Date Sampled		09/09/2017	09/09/2017	09/09/2017	09/09/2017
Type of sample		SOIL	SOIL	SOIL	SOIL
Date analysed	-	15/09/2017	15/09/2017	15/09/2017	15/09/2017
Sample mass tested	g	Approx. 35g	Approx. 30g	Approx. 45g	Approx. 15g
Sample Description	-	Brown coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	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.
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-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. Note, 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-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. 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-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.

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-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.
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.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			13/09/2017	2	13/09/2017	13/09/2017		13/09/2017	[NT]
Date analysed	-			13/09/2017	2	13/09/2017	13/09/2017		13/09/2017	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	<25	2	<25	<25	0	99	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	2	<25	<25	0	99	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	2	<0.2	<0.2	0	87	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	2	<0.5	<0.5	0	89	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	2	<1	<1	0	107	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	2	<2	<2	0	105	[NT]
o-Xylene	mg/kg	1	Org-016	<1	2	<1	<1	0	107	[NT]
naphthalene	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	86	2	100	87	14	92	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			13/09/2017	2	13/09/2017	13/09/2017		13/09/2017	[NT]
Date analysed	-			13/09/2017	2	13/09/2017	13/09/2017		13/09/2017	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	2	<50	<50	0	83	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	2	<100	<100	0	84	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	2	<100	<100	0	91	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	2	<50	<50	0	83	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	2	<100	<100	0	84	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	2	<100	<100	0	91	[NT]
Surrogate o-Terphenyl	%		Org-003	75	2	87	87	0	76	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			13/09/2017	2	13/09/2017	13/09/2017		13/09/2017	[NT]
Date analysed	-			13/09/2017	2	13/09/2017	13/09/2017		13/09/2017	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	2	<0.1	<0.1	0	98	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	2	<0.1	<0.1	0	108	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	2	<0.1	<0.1	0	104	[NT]
Anthracene	mg/kg	0.1	Org-012	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	2	0.2	0.1	67	102	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	2	0.2	0.1	67	104	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	2	0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	2	0.1	<0.1	0	115	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	2	0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	2	0.1	0.09	11	100	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	91	2	88	86	2	109	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			13/09/2017	2	13/09/2017	13/09/2017		13/09/2017	[NT]
Date analysed	-			13/09/2017	2	13/09/2017	13/09/2017		13/09/2017	[NT]
HCB	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	96	[NT]
gamma-BHC	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	107	[NT]
Heptachlor	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	98	[NT]
delta-BHC	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	99	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	104	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	113	[NT]
Dieldrin	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	128	[NT]
Endrin	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	109	[NT]
pp-DDD	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	115	[NT]
Endosulfan II	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	99	[NT]
Methoxychlor	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	94	2	92	87	6	115	[NT]

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			13/09/2017	2	13/09/2017	13/09/2017		13/09/2017	[NT]
Date analysed	-			13/09/2017	2	13/09/2017	13/09/2017		13/09/2017	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	96	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	83	[NT]
Dimethoate	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	110	[NT]
Fenitrothion	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	100	[NT]
Malathion	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	79	[NT]
Parathion	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	91	[NT]
Ronnel	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	112	[NT]
Surrogate TCMX	%		Org-008	94	2	92	87	6	91	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			13/09/2017	2	13/09/2017	13/09/2017		13/09/2017	[NT]
Date analysed	-			13/09/2017	2	13/09/2017	13/09/2017		13/09/2017	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	2	<0.1	<0.1	0	109	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	94	2	92	87	6	91	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			13/09/2017	2	13/09/2017	13/09/2017		13/09/2017	[NT]
Date analysed	-			13/09/2017	2	13/09/2017	13/09/2017		13/09/2017	[NT]
Arsenic	mg/kg	4	Metals-020	<4	2	7	8	13	112	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	2	<0.4	<0.4	0	98	[NT]
Chromium	mg/kg	1	Metals-020	<1	2	13	14	7	106	[NT]
Copper	mg/kg	1	Metals-020	<1	2	28	30	7	111	[NT]
Lead	mg/kg	1	Metals-020	<1	2	18	18	0	102	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	2	<0.1	<0.1	0	94	[NT]
Nickel	mg/kg	1	Metals-020	<1	2	11	11	0	101	[NT]
Zinc	mg/kg	1	Metals-020	<1	2	31	36	15	102	[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: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

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.

Aileen Hie

From: Harry Leonard <HLeonard@jkgroup.net.au>
Sent: Tuesday, 19 September 2017 8:16 AM
To: Customer Service
Cc: Aileen Hie
Subject: RE: Results for Registration 175381 E30809K, Sydney Olympic Park

Morning,

Could I please ask for TCLP analysis for Nickel on the following samples:

4 - BH2 (0.05-0.1);
7 - BH3 (0.1-0.2).

Any questions, let me know.

Envirolab Ref: 175381A
Due: 26/9/17
Std TAT.

Regards,

Harry Leonard
Environmental Scientist

T: +612 9888 5000
F: +612 9888 5001
HLeonard@jkgroup.net.au
www.jkgroup.net.au

ENVIRONMENTAL INVESTIGATION SERVICES
CONSULTING ENVIRONMENTAL ENGINEERS AND SCIENTISTS
PO Box 976, North Ryde BC NSW 1670
115 Wicks Rd, Macquarie Park NSW 2113

From: Ken Nguyen [mailto:KNguyen@envirolab.com.au]
Sent: Monday, 18 September 2017 7:43 PM
To: Harry Leonard <HLeonard@jkgroup.net.au>
Subject: Results for Registration 175381 E30809K, Sydney Olympic Park

Please refer to attached for:
a copy of the Certificate of Analysis
a copy of the COC/paperwork received from you
an Excel or .csv file containing the results
Please note that a hard copy will not be posted.

Enquiries should be made directly to:
customerservice@envirolab.com.au

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Environmental Investigation Services
Attention	Harry Leonard

Sample Login Details

Your reference	E30809K, Sydney Olympic Park
Envirolab Reference	175381-A
Date Sample Received	12/09/2017
Date Instructions Received	19/09/2017
Date Results Expected to be Reported	26/09/2017

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	Additional Testing on 2 Soils
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	12.9
Cooling Method	Na
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	Metals in TCLP USEPA1311	On Hold
BH1-0-0.1		✓
BH1-0.8-1.0		✓
BH1-1.5-1.9		✓
BH2-0.05-0.1	✓	
BH2-0.8-1.0		✓
BH2-1.5-1.95		✓
BH3-0.1-0.2	✓	
BH3-0.5-0.95		✓
BH3-1.5-1.8		✓
BH4-0.1-0.2		✓
BH4-0.5-0.65		✓
BH4-1.3-1.5		✓

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.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 175381-A

Client Details

Client	Environmental Investigation Services
Attention	Harry Leonard
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E30809K, Sydney Olympic Park**
Number of Samples	Additional Testing on 2 Soils
Date samples received	12/09/2017
Date completed instructions received	19/09/2017

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	26/09/2017
Date of Issue	26/09/2017

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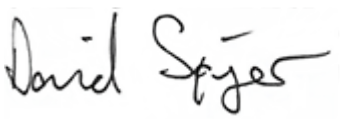
Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Asbestos Approved By
Analysed by Asbestos Approved Identifier: Lucy Zhu
Authorised by Asbestos Approved Signatory: Paul Ching

Results Approved By
Long Pham, Team Leader, Metals

Authorised By



David Springer, General Manager

Metals in TCLP USEPA1311			
Our Reference		175381-A-4	175381-A-7
Your Reference	UNITS	BH2	BH3
Depth		0.05-0.1	0.1-0.2
Date Sampled		09/09/2017	09/09/2017
Type of sample		SOIL	SOIL
Date extracted	-	26/09/2017	26/09/2017
Date analysed	-	26/09/2017	26/09/2017
pH of soil for fluid# determ.	pH units	9.9	9.4
pH of soil TCLP (after HCl)	pH units	1.7	1.6
Extraction fluid used	-	1	1
pH of final Leachate	pH units	5.0	4.9
Nickel in TCLP	mg/L	0.1	0.2

Method ID	Methodology Summary
EXTRACT.7	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
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 in house method INORG-004.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.

QUALITY CONTROL: Metals in TCLP USEPA1311						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			26/09/2017	[NT]	[NT]	[NT]	[NT]	26/09/2017	[NT]
Date analysed	-			26/09/2017	[NT]	[NT]	[NT]	[NT]	26/09/2017	[NT]
Nickel in TCLP	mg/L	0.02	Metals-020 ICP-AES	<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: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

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.