ENVIRONMENTAL INVESTIGATION SERVICES

9 May 2018
Report Ref: E31344KGlet-WC&ASS

Downer Group
Unit 2, 16 Galleghan Street
Hexham NSW 2322

Attention: Kari Torpstrom

WASTE CLASSIFICATION ASSESSMENT & PRELIMINARY ACID SULFATE SOIL ASSESSMENT
PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION DEVELOPMENT
7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW 2136

1 INTRODUCTION

Downer Group ('the client') commissioned Environmental Investigation Services (EIS)[1] to assign a waste classification for off-site disposal of soil that is to be excavated and removed from the site located at 7-9 Dunlop Street, Strathfield South during the proposed development works.

The scope of work also included a preliminary assessment of the risk of encountering actual or potential Acid Sulfate Soil (ASS) during the proposed development works and to assess whether an Acid Sulfate Soil Management Plan (ASSMP) is required.

The site location is shown on Figure 1 and sampling for the assessment was confined to the in-situ soil in the investigation area as shown on Figure 2 attached in the appendices.

The assessment was undertaken generally in accordance with an EIS proposal (Ref: EP45967KD) of 23 February 2018 and written acceptance from Downer Group by email of 5 March 2018.

A geotechnical investigation was undertaken in conjunction with the waste classification and ASS assessment by JK Geotechnics[2] and the results are presented in a separate report (Ref: 31344ZArpt, dated 7 May 2018).

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

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2 BACKGROUND

EIS have prepared a Stage 1 & 2 Environmental Site Assessment report for the proposed development (EIS ref: E28660KBrpt, dated 8 October 2015). A preliminary waste classification was provided in conjunction with the above assessment. EIS recommended that additional waste classification and ASS testing be undertaken.

EIS have undertaken a Stage 1 & 2 Environmental Site Assessment for the site in 2015. The report (Ref: E28660KBrpt) issued on 8 October 2015 classified the material as Restricted Soil Waste containing asbestos. However no TCLP analysis was commissioned, this may have reduced the classification to General Solid Waste containing asbestos.

2.1 Assessment Guidelines

The waste classification for the off-site disposal of the material was assessed in accordance with the NSW EPA Waste Classification Guidelines - Part 1: Classifying Waste (2014)[3].

The ASS assessment and preparation of the report was undertaken with reference to the Acid Sulfate Soil Management Advisory Committee (ASSMAC) Acid Sulfate Soil Manual (1998)[4]. Background information on ASS and the assessment process is provided in the appendices.

2.2 Proposed Development Details

EIS understand that the proposed development includes the construction of a new zone substation comprising of a single storey switch and control building for 11kV and 132kV switchgear, and two transformer bays. The proposed building will be partially underlain by a cable basement. The proposed cable basement will require excavation to depths of approximately 2.5m and 3.5m below ground level (bgl). Two external transformer bund hardstand areas and on-grade driveways are also proposed towards the north-eastern corner of the site.

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

[4] Acid Sulfate Soils Management Advisory Committee (ASSMAC), (1998). *Acid Sulfate Soils Manual* (ASS Manual 1998)

3 SITE INFORMATION

3.1 Site Identification and Description

Table 3-1: Site Identification

Site Address:	7-9 Dunlop Street, Strathfield South, NSW 2136
Lot & Deposited Plan:	Lots 15 & 16 in DP29223
Current Land Use:	Commercial
Approximate Site Area (m^2):	2,075
Geographical Location (approx.):	Latitude: -33. 89527 Longitude: 151. 079641

The site is located in a predominantly residential and commercial/industrial area of Strathfield South. The site is located in gently undulating regional topography on a south east facing hillside generally sloping down at 2° and increasing to 5° within the south eastern corner of the site. A concrete lined section of the Cooks River is located approximately 100m to the south of the site.

The site was located to the east of Dean Reserve. Commercial properties were located at the adjacent north and south of the site. Commercial properties were located to the east of the site beyond Dunlop Street. At the time of the inspection the site was concrete paved with no visible aboveground infrastructure.

3.2 Background/Historical Information

EIS has undertaken a preliminary historical assessment based on a review of the following information:

- The 1943 and 2016 aerial photographs for the site provided by SIX Maps[5]; and
- The contaminated land records provided by the NSW EPA[6].

Based on interpretation of the 1943 aerial photograph the site was vacant land. A quarry was located to the west of the site where the existing Dean Reserve is located. There were no records for the site on the NSW EPA contaminated land registers.

Considering the above information, the waste classification assessment will consider a broad suite of potential contaminants as outlined in Section 5.4.

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

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

3.3 Regional Geology

Regional geological information presented in the Lotsearch report presented in the EIS 2016 report indicated that the site is underlain by Quaternary aged deposits of silty to peaty quartz sand, silt, and clay with ferruginous and humic cementation in places and common shell layers.

3.4 Acid Sulfate Soil Risk Map

A review of the ASS risk maps of Botany Bay prepared by Department of Land and Water Conservation (1997)[7] indicates that the site is located on the boundary of "no known occurrence" of acid sulfate soil and an area of low probability of acid sulfate at a depths greater than 3m below the ground surface.

4 ASSESSMENT CRITERIA

4.1 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)[8] 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 4-1: Waste Categories

Category	Description
General Solid Waste (non-putrescible)	• If Specific Contaminant Concentration (SCC) ≤ Contaminant Threshold (CT1) then Toxicity Characteristics Leaching Procedure (TCLP) not needed to classify the soil as general solid waste; • If TCLP ≤ TCLP1 and SCC ≤ SCC1 then treat as general solid waste
Restricted Solid Waste (non-putrescible)	• If SCC ≤ CT2 then TCLP not needed to classify the soil as restricted solid waste; and • If TCLP ≤ TCLP2 and SCC ≤ SCC2 then treat as restricted solid waste
Hazardous Waste	• If SCC > CT2 then TCLP not needed to classify the soil as hazardous waste; and • If TCLP > TCLP2 and/or SCC > SCC2 then treat as hazardous waste.
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

[7] Department of Land and Water Conservation, (1997). *1:25,000 Acid Sulfate Soil Risk Map (Series 9130N3, Edition 2).*

[8] Protection of Environment Operations Act 1997 (NSW) (POEO Act 1997)

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

4.2 ASS Investigation Requirements

The ASS Manual 1998 recommends a minimum of four sampling locations for a site with an area up to 1ha (10,000m^2). For sites greater than 4ha, the manual recommends the use of a reduced density of two locations per hectare subject to the proposed development.

The sampling locations should include all areas where significant disturbance of soils will occur and/or areas with a high environmental sensitivity. In some instances, a varied sampling plan may be more suitable, particularly for sites less than 1,000m^2 in area.

The depth of investigation should extend to at least 1m beyond the depth of proposed excavation/disturbance or estimated drop in water table height, or to a minimum of 2m below existing ground level, whichever is greatest.

4.3 ASS Action Criteria

The ASS Manual 1998 presents 'action criteria' for the interpretation of laboratory results. The 'action criteria' define the need to prepare an ASSMP and are based on soil pH, potential acidity and the percentage of oxidisable sulfur for broad categories of soil types. Where disturbance of greater than 1,000 tonnes of ASS is proposed, the action criteria for 'coarse textured soils' apply to all soil types.
The following action criteria are presented in the ASS Manual:

Table 4-2: ASS Action Criteria

Category	Description	Criteria
Coarse Textured Soils	Sands to loamy sands	• pH - less than 5; • Total Actual Acidity (TAA)/Total Sulfide Acidity (TSA)/ Total Potential Acidity (TPA) (pH5.5) – greater than 18mol H^+/tonne; and • S_{pos} – greater than 0.03% sulfur oxidisable.
Medium Textured Soils	Sandy loams to light clays	• pH - less than 5; • TAA/TSA/TPA (pH5.5) – greater than 36mol H^+/tonne; and • S_{pos} – greater than 0.06% sulfur oxidisable.

Category	Description	Criteria
Fine Textured Soils	Medium to heavy clays and silty clays	• pH - less than 5; • TAA/TSA/TPA (pH5.5) – greater than 62mol H^+/tonne; and • S_{pos} – greater than 0.1% sulfur oxidisable.

The action criteria for Fine Textured soils has been used for this assessment on the basis that the earthworks and piling will disturb less than 1,000 tonnes of ASS. The bulk of the excavation will be into fill-soil and the suspected ASS is located in a thin strata of organic material located in the northwest section of the site at the depth of approximately 6m below the existing ground level.

5 INVESTIGATION PROCEDURE

5.1 Subsurface Investigation and Soil Sampling

Field work for this investigation was undertaken from 19 to 22 March 2018. Soil samples for Waste Classification and ASS assessments were obtained from six boreholes drilled for the geotechnical investigation by JK Geotechnics. The sampling locations are shown on Figure 2 attached in the appendices. The geotechnical investigation was limited to a maximum depth of approximately 13m.

Based on the proposed development details provided at the time of reporting, the number of sample locations and the depth of sampling meets the minimum requirements outlined in the ASS Manual 1998.

The sample locations were drilled using a 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.

Soil samples were collected from the fill and natural profiles encountered during the investigation. 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.

5.2 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.

5.3 Sample Preservation

Soil samples for waste classification were preserved by immediate storage in an insulated sample container with ice in accordance with AS4482.1-2005 and AS4482.2-1999[9] as summarised in the following table. The soil samples for ASS assessment were preserved by immediate storage in an insulated sample container with ice and frozen upon return to the EIS office.

Table 5-1: 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.

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

5.4 Laboratory Analysis

Samples for the Waste Classification were analysed for a range of potential contaminants based on the site information presented in Section 3. 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.

Nine (9) 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);
- Polychlorinated biphenyls (PCBs);
- Asbestos; and
- TCLP leachate analysis for PAHs and heavy metals where required.

Two (2) selected in-situ natural soil samples were analysed for the following:

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

One fill and seven selected natural soil samples were analysed for ASS/PASS using the suspension Peroxide Combined Acidity and Sulfur (sPOCAS) analytical methods detailed in AS4969-2008/09[10]. Confirmation of elevated peroxide oxidisable sulfer (Spos) results was undertaken using the chromium reducible sulfer method.

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[11]). Reference should be made to the laboratory reports (Ref: 188062, 188062A and 188074) attached in the appendices for further information.

[10] Standards Australia, (2008/2009). *Analysis of acid sulfate soil – Dried samples – Methods of test, Parts 1 to 14.* (AS4969-2008/09)

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

6 RESULTS OF THE INVESTIGATION

6.1 Subsurface Conditions

The subsurface conditions encountered generally consisted of concrete pavement or asphaltic concrete pavement, underlain by fill material to a maximum depth of approximately 4.8m, underlain by silty clay. Shale bedrock was encountered underneath the clay to the termination depth of the boreholes at approximately 13m. The fill material typically consisted of brown silty clay with inclusions of gravel, ash, slag, brick fragments, glass fragments and organic matter. Reference should be made to the borehole logs attached in the appendices for further details.

6.2 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.

6.3 Laboratory Results – Waste Classification Assessment

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 6-1: 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	11	2	0	Lead concentrations exceeded the CT1 criterion in two fill samples collected from BH205 (3.4-3.5m) and BH207 (2.9-3.0m). The maximum lead concentration was 550mg/kg.
TRH	11	0	0	All results were below the CT1 criterion.
BTEX	8	0	0	All results were below the laboratory practical quantitation limits (PQLs) and CT1 criteria.
Total PAHs	11	0	0	All results were below the CT1 criterion.
Benzo(a)pyrene	11	1	0	One B(a)P result exceeded the CT1 concentration. A B(a)P concentration of 0.97 mg/kg was detected in the fill sample from BH207 (0.2-0.3m).
OCPs & OPPs	11	0	0	All results were below the laboratory PQLs and CT1 criteria.
PCBs	11	0	0	All results were below the laboratory PQLs and CT1 criteria.

Analyte	No. of Samples Analysed	No. of Results > CT Criteria	No. of Results > SCC Criteria	Comments
Asbestos	9	-	-	Asbestos was not detected in the samples analysed.

Table 6-2: Summary of Soil Laboratory Results Compared to TCLP Criteria

Analyte	No. of Samples Analysed	No. of Results > TCLP Criteria	Comments
Lead	2	0	The two fill samples with lead concentrations above the CT1 criterion were analysed for TCLP lead. Both results were below the TCLP1 criterion.
Benzo(a)pyrene	1	0	The fill sample with B(a)P concentration above the CT1 criterion was analysed for TCLP PAHs. The result was below the TCLP1 criterion.

6.4 Laboratory Results – ASS Assessment

The soil laboratory results were assessed against the action criteria adopted for the assessment. The results are presented in the attached report tables and summarised below.

Table 6-3: Summary of ASS Results

Analyte	Results Compared to ASS Guidelines
pH_{kcl} and pH_{ox}	The pH_{KCl} results ranged from 4.1 to 8.5. One sample (BH202 – 1.0-1.2m) had pH_{KCl} results exceeded (i.e. was below) the action criterion of pH 5. Following oxidation, the pH_{ox} results for the samples ranged from 3.7 to 7.7. Two samples (BH202 – 1.0-1.2m and BH203 – 6.3-6.5m) had pH_{KCl} results exceeded (i.e. were below) the action criterion of pH 5.
Acid Trail	• TAA results ranged from less than the practical quantitation limit (PQL) to 61mol H^+/tonne. All results were below the action criterion of 62mol H^+/tonne; • TPA results ranged from less than the PQL to 78mol H^+/tonne. This result was above the action criterion of 62mol H^+/tonne; and • TSA results ranged from less than PQL to 16mol H^+/tonne. All the results were below the action criterion of 62mol H^+/tonne.
Sulfur Trail	The S_{pos}% results ranged for <0.005% to 0.06%. The S_{pos}% results did not exceed the action criterion of 0.1%.
Liming Rate	The liming rate required for neutralisation ranged from 1.6 kg$CaCO_3$/tonne to 4.7 kg$CaCO_3$/tonne.

7 CONCLUSIONS

7.1 Acid Sulfate Soil

Two samples returned results that were outside the acceptance criteria. Sample BH202 (1.0-1.2) was a fill sample with pH_{kcl} and pH_{ox} values outside of the acceptance criteria. This was also reflected in the elevated TPA result. These elevations were considered to be associated with other factors affecting acidity (e.g. humic acids) rather than ASS as the concentration of peroxide oxidisable sulfer (S_{pos}) in the sample was below the action criteria.

Sample BH203 (6.3-6.5) returned a pH_{ox} value outside of the acceptance criteria. As discussed above this was considered to be associated with other factors (e.g. humic acids) rather than ASS as the S_{pos} concentration was below the action criteria. Based on these results EIS are of the opinion that the risk of encountering ASS is low and an ASS management plan is not considered necessary for this site.

7.2 Waste Classification

The previous report (Ref: E28660KBrpt dated 8 October 2015) classified the fill material as Restricted Solid Waste containing asbestos. However, no TCLP analysis was commissioned and EIS were of the opinion that TCLP analysis may have reduced the waste classification to General Solid Waste (GSW) containing asbestos.

Based on the results of this assessment (including TCLP analysis) the following waste classifications would apply:

Cable Basement Excavation – Fill material excavated for the cable basement would be classified as GSW containing asbestos. The underlying natural soil would be classified as VENM. We recommend the site is inspected by an Environmental Consultant after removal of the fill and prior to excavating the VENM.

Piling Spoil – The most economical way of dealing with the piling spoil would be to divide the site into two sections centred on BH208. To the east of BH208 the fill is shallow and could be stripped of and disposed of as GSW containing asbestos. Once the natural soil has been exposed the piles to the east of BH208 will only return VENM to the surface. As noted above we recommend that this area is inspected by an Environmental Consultant after removal of the fill. To the west of BH208 stripping the fill will not be viable due to the depth. Therefore the piling spoil to the west of BH208 will be a mixture of fill and natural soil and will be classified as GSW containing asbestos.

This procedure will require careful management of earthworks to minimise the volume of GSW containing asbestos requiring disposal. Any VENM that becomes mixed with the fill will be classified as GSW containing asbestos.

7.3 Recommendations

Any unexpected finds encountered during the site works should be inspected by a suitably qualified contaminated land consultant[12]. 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.

Due to the contaminants encountered in the fill samples, EIS are of the opinion that the potential for widespread contamination at the site is relatively high. EIS recommend undertaking an Environmental Site Assessment (ESA) to meet the relevant NSW EPA guidelines to characterise the contamination risk to receptors.

Should significant quantities of fill material require disposal, EIS consider that further assessment will be required to adequately assess and classify the fill material at the site.

Following removal of the fill material additional tests should be undertaken on the natural soil underlying the order to classify the material as VENM.

7.4 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.

[12] EIS recommend that the consultancy engaged for the work be a member of the Australian Contaminated Land Consultants Associated (ACLCA), and/or the individual undertaking the works be certified under one of the NSW EPA endorsed certified practitioner schemes

8 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,

Para Bokalawela
Senior Environmental Engineer

Adrian Kingswell
Principal

Appendices:

Appendix A: Report Figures
Appendix B: Laboratory Summary Tables
Appendix C: Borehole Logs
Appendix D: Laboratory Reports & 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: 7-9 DUNLOP STREET
STRATHFIELD SOUTH, NSW

Report No: E31344KG

Figure No: 1

ENVIRONMENTAL INVESTIGATION SERVICES

EIS

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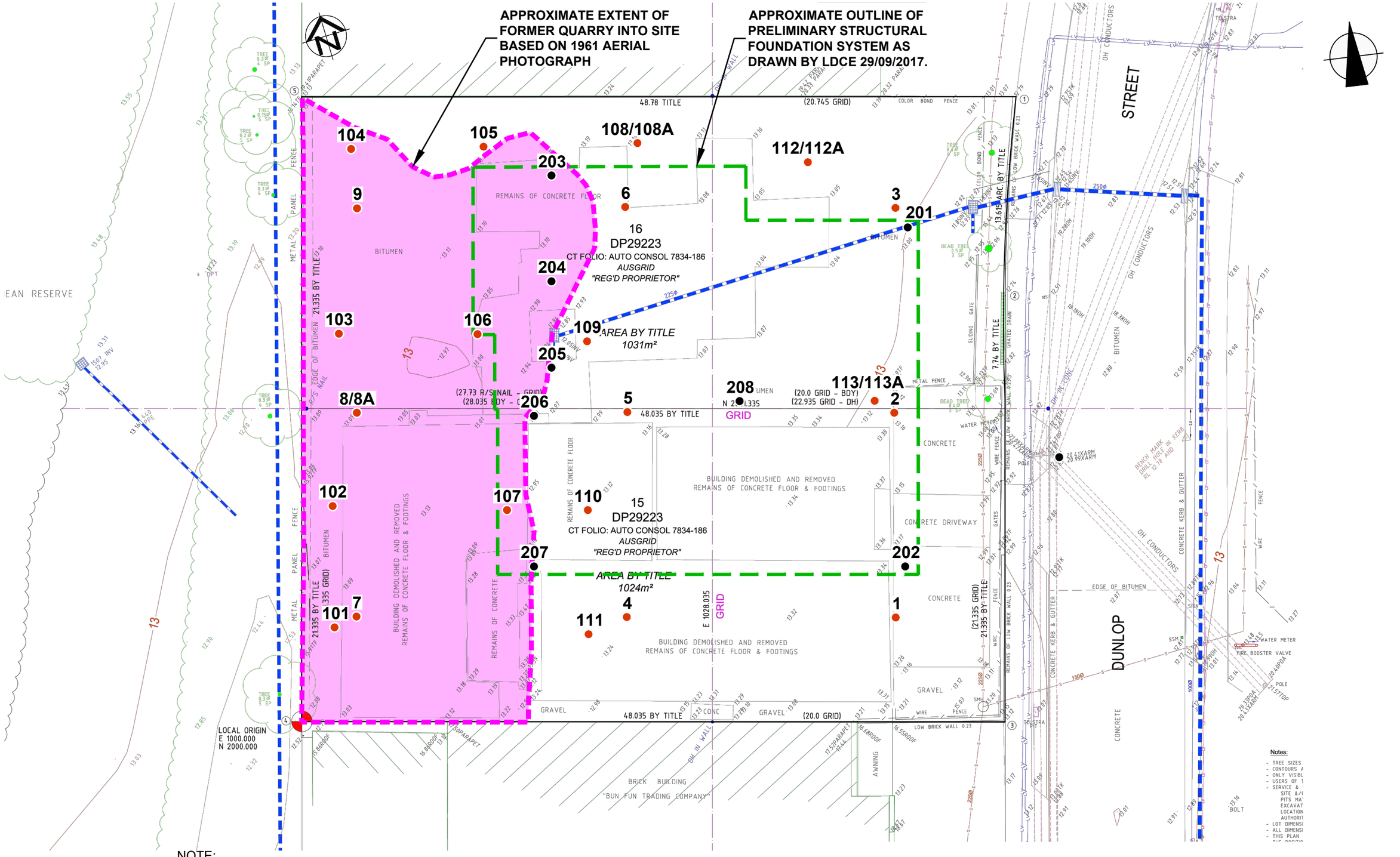

NOTE:

1. BOREHOLES 1 TO 9 ARE FROM OUR PREVIOUS GEOTECHNICAL INVESTIGATION REPORT, REF. 28660ZArpt, DATED 9 OCTOBER 2015.
2. BOREHOLES 101 TO 113/113A ARE FROM OUR PREVIOUS GEOTECHNICAL INVESTIGATION, REPORT, REF. 28660ZA2RPT, DATED 15 MARCH 2016.
3. BOREHOLES 201 TO 208 ARE FROM THE CURRENT INVESTIGATION.

0 2.5 5 7.5 10 12.5
SCALE 1:250 @A3 METRES

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

Title: **BOREHOLE LOCATION PLAN**

Location: 7-9 DUNLOP STREET
STRATHFIELD SOUTH, NSW

Report No: E31344KG

Figure No: 2

ENVIRONMENTAL INVESTIGATION SERVICES

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Appendix B: Laboratory Summary Tables

Waste Classification and ASS Assessment
7-9 Dunlop Street, Strathfield South, NSW 2136
Job No: E31344KGlet

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	TRH					BTEX COMPOUNDS				ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P	Total Endosulfans	Chloropyrifos	Total Moderately Harmful	Total Scheduled	PCBs	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			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			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			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			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**																									
BH201	0.2-0.3	Fill-Silty sandy gravel	6	<0.4	12	42	48	<0.1	11	65	0	<0.05	<PQL	NA	<PQL	<PQL	<PQL	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
BH201	0.8-1.0	Silty CLAY	<4	<0.4	8	3	8	<0.1	2	5	0	<0.05	<PQL	NA	<PQL	<PQL	<PQL	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	NA
BH202	0.2-0.3	Fill-Gravelly clay	5	<0.4	12	12	17	<0.1	8	46	0	<0.05	<PQL	NA	<PQL	<PQL	<PQL	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
BH202	1.0-1.2	Silty CLAY	<4	<0.4	20	4	9	<0.1	2	5	0	<0.05	<PQL	NA	<PQL	<PQL	<PQL	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	NA
BH203	0.2-0.3	Fill-Silty clay	5	<0.4	13	37	66	<0.1	23	60	0.35	0.05	<PQL	NA	<PQL	<PQL	<PQL	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
BH205	0.1-0.2	Fill-Silty gravelly clay	8	<0.4	20	22	58	<0.1	9	70	0.9	0.1	<PQL	NA	<PQL	<PQL	<PQL	<25	<50	100	180	280	<0.2	<0.5	<1	<3	Not Detected
BH205	1.0-1.1	Fill-Silty clay	6	<0.4	15	14	31	<0.1	6	28	0.39	0.09	<PQL	NA	<PQL	<PQL	<PQL	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
BH205	3.4-3.5	Fill-Silty clay	12	0.6	20	64	**110**	<0.1	13	170	0.2	<0.05	<PQL	NA	<PQL	<PQL	<PQL	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
BH207	0.2-0.3	Fill-Sand	<4	<0.4	6	42	12	<0.1	4	51	11	**0.97**	<PQL	NA	<PQL	<PQL	<PQL	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
BH207	2.9-3.0	Fill-Clayey silt	9	6.1	29	450	**550**	0.2	35	790	0	<0.05	<PQL	NA	<PQL	<PQL	<PQL	<25	<50	100	150	250	<0.2	<0.5	<1	<3	Not Detected
BH208	0.2-0.3	Fill-Silty clay	6	<0.4	10	11	30	<0.1	5	30	0	<0.05	<PQL	NA	<PQL	<PQL	<PQL	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
Total Number of samples			11	11	11	11	11	11	11	11	11	11	11	0	11	11	11	11	11	11	11	11	11	11	11	11	9
Maximum Value			12	6.1	29	450	550	0.2	35	790	11	0.97	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	100	180	280	<PQL	<PQL	<PQL	<PQL	NC

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

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TABLE B
SOIL LABORATORY TCLP RESULTS
All data in mg/L unless stated otherwise

			Arsenic	Cadmium	Chromium	Lead	Mercury	Nickel	B(a)P
PQL - Envirolab Services			0.05	0.01	0.01	0.03	0.0005	0.02	0.001
TCLP1 - General Solid Waste			5	1	5	5	0.2	2	0.04
TCLP2 - Restricted Solid Waste			20	4	20	20	0.8	8	0.16
TCLP3 - Hazardous Waste			>20	>4	>20	>20	>0.8	>8	>0.16
Sample Reference	**Sample Depth**	**Sample Description**							
BH205	3.4-3.5	Fill-Silty clay	NA	NA	NA	0.1	NA	NA	NA
BH207	0.2-0.3	Fill-Sand	NA	NA	NA	NA	NA	NA	<0.001
BH207	2.9-3.0	Fill-Clayey silt	NA	NA	NA	0.2	NA	NA	NA
Total Number of samples			0	0	0	2	0	0	1
Maximum Value			<PQL	<PQL	<PQL	0.2	<PQL	<PQL	<PQL

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

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TABLE C

SUMMARY OF LABORATORY RESULTS - ACID SULFATE SOIL ANALYSIS (sPOCAS)

		Analysis	pH_{KCL}	TAA	pH_{ox}	TPA	TSA	S_{POS}	S_{Cr}	Liming Rate
				pH 6.5		pH 6.5	pH 6.5	%w/w	%w/w	kg $CaCO_3$/tonne
Acid Sulfate Soil Manual (1998) -Action Criteria		Fine Textured Soil	pH 5.0	62molH+/ tonne	pH 5.0	62molH+/ tonne	62molH+/ tonne	0.1% w/w	0.1% w/w	
Sample Reference	**Sample Depth (m)**	**Sample Description**								
BH202	1.0-1.2	Silty Clay	4.1	61	4.3	78	16	<0.005	NA	4.7
BH202	5.8-6.0	Silt	5.6	<5	6.4	<5	<5	<0.005	NA	<0.75
BH203	0.5-0.95	Fill-Silty Clay	7.8	<5	7.5	<5	<5	0.02	NA	<0.75
BH203	1.8-1.95	Silty Clay	5.2	<5	6.4	<5	<5	<0.005	NA	<0.75
BH203	6.3-6.5	Organic Silty Clay	6.5	<5	3.7	15	15	0.06	0.006	1.6
BH203	7.5-7.85	Silty Clay	7.4	<5	7.2	<5	<5	0.02	NA	<0.75
BH205	4.4-4.5	Fill-Silty Clay	8.5	<5	7.7	<5	<5	0.06	0.05	<0.75
BH207	4.3-4.4	Silty Clay	7.6	<5	7.7	<5	<5	0.006	NA	<0.75
Total Number of Samples			8	8	8	8	8	8	2	8
Minimum Value			4.1	61	3.7	15	15	0.006	0.006	1.6
Maximum Value			8.5	61	7.7	78	16	0.06	0.05	4.7

Values Exceeding Action Criteria — **VALUE**

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Appendix C: Borehole Logs

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Borehole No. 201
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BOREHOLE LOG

Client: DOWNER

Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION

Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~13.0 m

Date: 21/3/18 **Datum:** AHD

Plant Type: HYDROPOWER **Logged/Checked By:** T.P./A.J.

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
									-	ASPHALTIC CONCRETE: 40mm.t FILL: Silty sandy gravel, fine to coarse grained, igneous, grey, fine to medium grained sand, trace of glass fragments and sandstone cobbles.	M			NO SPT AT 0.5m DUE TO OBSTRUCTIONS IN FILL
									CI	Silty CLAY: medium plasticity, grey mottled orange brown.	w>PL	VSt		CH4 0% LEL ALLUVIAL
ON COMPLETION OF CORING					N = 18 5,8,10	12	1						380 390 370	
						11	2		CL-CI	Silty CLAY: low to medium plasticity, grey mottled orange brown, trace of fine to medium grained ironstone gravel.		S - F		
ON COMPLETION OF AUGERING					N=0 0,0,0	10	3						90 70 80	SPT SUNK UNDER SELF-WEIGHT
						9	4					St - VSt		
					N = 9 2,3,6	8	5						230 150 180	
									CL	Silty CLAY: low plasticity, orange brown mottled grey, with clayey silty bands.		St		
					N = 7 1,3,4	7	6						150 180 160	

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Borehole No. 201
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BOREHOLE LOG

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~13.0 m
Date: 21/3/18 **Datum:** AHD
Plant Type: HYDROPOWER **Logged/Checked By:** T.P./A.J.

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
									CL	Silty CLAY: low plasticity, orange brown mottled grey, with clayey silty bands. *(continued)*	w>PL	VSt		
				■	N = 18 5,8,10								280 270 310	
						5	8							
									-	SHALE: brown and grey.	XW	Hd		EXTREMELY WEATHERED ROCK
				■	N > 25 15,25/ 80mm REFUSAL	4	9							
										REFER TO CORED BOREHOLE LOG				
						3	10							
						2	11							
						1	12							
						0	13							

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Borehole No. 201
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CORED BOREHOLE LOG

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA | **Core Size:** NMLC | **R.L. Surface:** ~13.0 m
Date: 21/3/18 | **Inclination:** VERTICAL | **Datum:** AHD
Plant Type: HYDROPOWER | **Bearing:** N/A | **Logged/Checked By:** T.P./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	DEFECT DETAILS: SPACING (mm) (600, 200, 60, 20)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
					START CORING AT 9.48m						
100% RETURN		3	10		SHALE: dark grey and orange brown.	XW	Hd				Ashfield Shale
					SHALE: grey, with dark grey laminae, bedded at 0-5°	FR	M - H				
							M			(10.04-10.61m) XWS, 0 - 3°, 5-10mm.t, TYPICALLY SPACED 15mm TO 60mm	
		2	11							(10.77m) XWS, 0 - 3°, 13 mm.t (10.93m) XWS, 0 - 3°, 4 mm.t (10.96m) XWS, 0 - 3°, 8 mm.t	
										(11.34m) XWS, 0 - 3°, 8 mm.t (11.58m) XWS, 0 - 3°, 8 mm.t	
		1	12							(11.93m) J, 72°, P, R, Cn (12.02m) J, 85°, P, R, Cn (12.09m) XWS, 0 - 3°, 25 mm.t (12.27m) XWS, 0 - 3°, 15 mm.t (12.34m) XWS, 0 - 3°, 3 mm.t (12.52m) XWS, 0 - 3°, 3 mm.t (12.54m) Cr, 0 - 3°, 5 mm.t (12.80m) XWS, 0 - 3°, 5 mm.t (12.83m) Jh, 50°, Un	
		0	13		END OF BOREHOLE AT 13.00 m						
		-1	14								
		-2	15								

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BOREHOLE LOG

Borehole No. 202

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~13.2 m
Date: 22/3/18 **Datum:** AHD
Plant Type: HYDROPOWER **Logged/Checked By:** T.P./A.J.

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
										CONCRETE: 140mm.t				8mm DIA. REINFORCEMENT 105mm TOP COVER
						13			-	FILL: Gravelly clay, low plasticity, red brown, fine to coarse grained sandstone gravel.	M			CH4 0% LEL
					N = 10 2,4,6				CI-CH	Silty CLAY: medium to high plasticity, brown mottled red brown.	w>PL	VSt	250 310 280	ALLUVIAL
						12	1		CI	Silty CLAY: medium plasticity, light grey mottled orange brown.		Hd		
					N = 20 6,9,11								>600 >600 >600	
						11	2		ML	SILT: low plasticity, light grey mottled orange brown.	w~PL	St		
					N = 10 4,5,5	10	3						120 120 110	
ON COMPLETION OF CORING							4		CL	Silty CLAY: low plasticity, light grey mottled orange brown.		VSt		
					N = 20 5,10,10	9								
						8	5							
									ML	SILT: low plasticity, light grey mottled orange, with medium plasticity clay bands.				
ON COMPLETION OF AUGERING					N = 10 5,7,3	7	6						320 360 310	

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Borehole No. 202
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BOREHOLE LOG

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~13.2 m
Date: 22/3/18 **Datum:** AHD
Plant Type: HYDROPOWER **Logged/Checked By:** T.P./A.J.

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
						6			CI	Silty CLAY: medium plasticity, orange brown mottled light grey, trace of fine to coarse grained ironstone gravel.	w>PL	Hd		
					N = 34 6,11,23								420 410 >600	
						8			-	SHALE: grey and orange brown.	XW	Hd		VERY LOW 'TC' BIT RESISTANCE
						5				REFER TO CORED BOREHOLE LOG				EXTREMELY WEATHERED ROCK
						4	9							
						3	10							
						2	11							
						1	12							
						0	13							

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Borehole No. 202 3 / 3

CORED BOREHOLE LOG

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Core Size:** NMLC **R.L. Surface:** ~13.2 m
Date: 22/3/18 **Inclination:** VERTICAL **Datum:** AHD
Plant Type: HYDROPOWER **Bearing:** N/A **Logged/Checked By:** T.P./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	DEFECT DETAILS: SPACING (mm) (600, 200, 60, 20)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
					START CORING AT 8.14m						
100% RETURN		5	9		SHALE: grey and orange brown, with very low strength bands.	XW	Hd				
		4									
			10		SHALE: grey, with dark grey laminae, bedded at 0-5°.	SW	M			(9.73m) CS, 0°, 10 mm.t (9.84m) CS, 0°, 10 mm.t	Ashfield Shale
		3								(10.01m) CS, 0°, 25 mm.t	
			11							(10.15m) XWS, 0 - 3°, 2 mm.t (10.20m) XWS, 0 - 3°, 4 mm.t	
		2				FR				(10.42m) XWS, 0 - 3°, 10 mm.t	
			12							(10.58m) CS, 0 - 3°, 15 mm.t	
		1								(11.72m) J, 70°, P, S, Cn (11.81m) J, 65°, P, R, Cn	
			13				H			(12.14m) XWS, 0 - 3°, 12 mm.t	
		0			END OF BOREHOLE AT 13.10 m					(12.82m) XWS, 0 - 3°, 25 mm.t	
			14								
		-1									

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Borehole No. 203
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BOREHOLE LOG

Client: DOWNER

Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION

Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~13.2 m

Date: 19/3/18 **Datum:** AHD

Plant Type: HYDROPOWER **Logged/Checked By:** T.P./A.J.

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
										CONCRETE: 130mm.t				8mm DIA. REINFORCEMENT 90mm TOP COVER
						13			-	FILL: Silty clay, medium plasticity, grey and brown, trace of fine grained sand, fine grained shale gravel, fine to medium grained sandstone gravel, and brick fragments.	w>PL			CH4 0% LEL
					N = 6 3,3,3								280 200	HYDROCARBON ODOUR
						12	1							APPEARS MODERATELY COMPACTED
					N = 4 0,1,3	11	2		CL-CI	Silty CLAY: low to medium plasticity, light grey mottled orange brown, trace of fine to medium grained ironstone gravel, and fine grained sand.	w>PL	S - F	50 70	CH4 0% LEL ALLUVIAL
												St	170 180	
												VSt		
					N = 8 2,4,4	10	3						250 220 300	CH4 0% LEL
▽ ON COMPLETION OF CORING							4		CI	Silty CLAY: medium plasticity, grey mottled orange brown, with stiff bands.		F		
					N = 3 2,1,2	9							50 70 60	
						8	5							
							6						70 60 70	
▽ ON COMPLETION OF AUGERING					N = 1 2,1,0	7			OH	Organic silty CLAY: medium plasticity, dark grey.		S	<25 30 50	

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Borehole No. 203
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BOREHOLE LOG

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~13.2 m
Date: 19/3/18 **Datum:** AHD
Plant Type: HYDROPOWER **Logged/Checked By:** T.P./A.J.

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
						6			OH	Organic silty CLAY: as above	w>PL	S		
									CI	Silty CLAY: medium plasticity, light grey mottled orange brown.		St		
	■			■	N = 11 1,3,8								120 170	
							8					VSt	300 390	
						5			-	SHALE: dark grey, with iron indurated bands.	XW	Hd		VERY LOW 'TC' BIT RESISTANCE EXTREMELY WEATHERED ROCK
				■		4	9				DW - SW	L - M		LOW TO MODERATE RESISTANCE ASHFIELD SHALE
										REFER TO CORED BOREHOLE LOG				
						3	10							
						2	11							
						1	12							
						0	13							

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Borehole No. 203 3 / 3

CORED BOREHOLE LOG

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Core Size:** NMLC **R.L. Surface:** ~13.2 m
Date: 19/3/18 **Inclination:** VERTICAL **Datum:** AHD
Plant Type: HYDROPOWER **Bearing:** N/A **Logged/Checked By:** T.P./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	DEFECT DETAILS: SPACING (mm) (600, 200, 60, 20)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
		4			START CORING AT 9.35m						
100% RETURN		3	10		SHALE: grey, with dark grey laminae and iron indurated bands, bedded at 0-5°.	DW - SW	L - M			(9.46m) J, 70 - 90°, Un, R, Fe Sn (9.52m) XWS, 0 - 5°, 6 mm.t (9.65m) J, 75 - 90°, Un, R, Fe Sn (9.81m) XWS, 0 - 5°, 7 mm.t (9.83m) XWS, 0 - 5°, 5 mm.t (9.89m) XWS, 0 - 5°, 10 mm.t (9.91m) CS, 0 - 5°, 20 mm.t	
		2	11		as above, but without iron indurated bands.	FR	M				Ashfield Shale
		1	12							(11.87m) Jh, 68°, Un (12.62m) Jh, 70°, Un (12.69m) Jh, 65°, Un	
		0	13		END OF BOREHOLE AT 13.00 m						
		-1	14								
		-2	15								

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Borehole No. 204
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BOREHOLE LOG

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~13.1 m
Date: 19/3/18 **Datum:** AHD
Plant Type: HYDROPOWER **Logged/Checked By:** T.P./A.J.

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
						13				CONCRETE: 120mm.t				NO REINFORCEMENT OBSERVED
									-	FILL: Silty clay, low plasticity, brown, orange brown and grey, trace of fine to medium grained ironstone gravel, ash and slag.	w>PL			HYDROCARBON ODOUR
					N = 9 3,4,5									CH4 0% LEL
						12	1							APPEARS MODERATELY COMPACTED
										FILL: Clayey sand, fine to medium grained, dark brown, trace of brick fragments.	M			APPEARS POORLY COMPACTED
					N = 5 3,2,3									CH4 0% LEL
						11	2							
										FILL: Silty clay, low to medium plasticity, trace of fine grained sand, fine to medium grained shale gravel, and brick fragments.	w>PL			HYDROCARBON ODOUR
					N = 5 1,2,3	10	3							CH4 0% LEL
ON COMPLETION OF AUGERING										FILL: Brick fragments in a clay matrix, red brown.	M			
						9	4							
					N=0 2,0,0									CH4 0% LEL
									CI	Silty CLAY: medium plasticity, grey mottled orange brown.	w>PL	F - St	140 140 110	ALLUVIAL
ON COMPLETION OF CORING						8	5							
										as above, but brown mottled grey.		F		
					N = 4 1,1,3	7	6						70 60 60	
										SILTY CLAY: as below.		VSt		

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Borehole No. 204
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BOREHOLE LOG

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~13.1 m
Date: 19/3/18 **Datum:** AHD
Plant Type: HYDROPOWER **Logged/Checked By:** T.P./A.J.

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
						6			CI	Silty CLAY: medium plasticity, light grey mottled orange brown, trace of fine to coarse grained ironstone gravel. *(continued)*	w>PL	VSt		
				■	N = 30 5,10,20	5	8						250 350 320	
100% RETURN						4	9			REFER TO CORED BOREHOLE LOG				
						3	10							
						2	11							
						1	12							
						0	13							

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Borehole No. 204 3 / 3

CORED BOREHOLE LOG

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Core Size:** NMLC **R.L. Surface:** ~13.1 m
Date: 19/3/18 **Inclination:** VERTICAL **Datum:** AHD
Plant Type: HYDROPOWER **Bearing:** N/A **Logged/Checked By:** T.P./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	DEFECT DETAILS: SPACING (mm) (600, 200, 60, 20)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
		5			START CORING AT 8.21m						
		4	9		SHALE: brown and grey, with very low to low strength bands.	XW	Hd			(8.40m) J, 75 - 90°, Un, R, Fe Sn	
					SHALE: grey, with dark grey laminae and iron indurated bands, bedded at 0-5°.	DW	M			(9.37m) J, 80 - 90°, Un, R, Cn (9.38m) CS, 0 - 5°, 35 mm.t	
		3	10		as above, but without iron indurated bands.	FR				(9.85m) XWS, 5°, 4 mm.t (10.03m) Jh, 60-90°, Un (10.08m) XWS, 3°, 8 mm.t (10.22m) XWS, 0°, 9 mm.t	Ashfield Shale
		2	11							(10.72m) XWS, 0°, 4 mm.t (10.78m) XWS, 2°, 6 mm.t	
		1	12				H			(11.69m) J, 50°, Un, R, Cn (11.71m) J, 50°, Un, R, Cn (11.93m) J, 45°, P, S, Cn (12.17m) J, 45°, Un, R, Cn	
		0	13		END OF BOREHOLE AT 12.84 m						
		-1	14								

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Borehole No. 205
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BOREHOLE LOG

Client: DOWNER

Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION

Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~12.9 m

Date: 20/3/18 **Datum:** AHD

Plant Type: HYDROPOWER **Logged/Checked By:** A.C.K./A.J.

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
										CONCRETE: 90mm.t				4mm DIA. REINFORCEMENT 42mm TOP COVER
									-	FILL: Silty gravelly clay, medium plasticity, grey brown mottled orange brown and red brown, fine to medium grained igneous gravel, with fine to medium grained sand.	w>PL			
					N = 4 2,1,3	12	1			FILL: Silty clay, medium to high plasticity, dark grey brown mottled light grey, grey and light brown, trace of glass and brick fragments.			80 230 145	CH4 0% LEL
					N = 1 1,1,0	11	2						70	CH4 0% LEL APPEARS POORLY COMPACTED
ON COMPLETION OF AUGERING					N = 3 6,1,2	10	3							CH4 0% LEL
										FILL: Silty clay, low plasticity, dark grey brown, trace of glass fragments.				
						9	4							CH4 0% LEL
									ML	Clayey SILT: low plasticity, light grey and light brown, with fine grained sand.	w>PL	St - VSt		SPT OMITTED DUE TO BOREHOLE COLLAPSE
						8	5							ALLUVIAL
									CH	Silty CLAY: high plasticity, light grey and light brown, trace of fine to medium grained ironstone gravel.				
					N = 17 6,8,9	7	6						210 110 180	
						6								

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BOREHOLE LOG

Borehole No. 205

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~12.9 m
Date: 20/3/18 **Datum:** AHD
Plant Type: HYDROPOWER **Logged/Checked By:** A.C.K./A.J.

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
	■			■					CH	Silty CLAY: high plasticity, light grey and light brown, with fine grained sand.	w>PL	VSt		
				■	N > 18 8,18/ 150mm REFUSAL								350 300 360	
						5	8			REFER TO CORED BOREHOLE LOG				
						4	9							
						3	10							
						2	11							
						1	12							
						0	13							
						-1								

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Borehole No.
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CORED BOREHOLE LOG

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Core Size:** NMLC **R.L. Surface:** ~12.9 m
Date: 20/3/18 **Inclination:** VERTICAL **Datum:** AHD
Plant Type: HYDROPOWER **Bearing:** N/A **Logged/Checked By:** A.C.K./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$	DEFECT DETAILS: SPACING (mm)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
					START CORING AT 7.82m						
100% RETURN		5	8		SHALE: dark grey, with brown and orange brown laminae, bedded at 0-5°.	XW - DW	Hd - VL				
						DW	L				
						XW - DW	Hd - VL				
		4	9			DW	L - M			(8.97m) XWS, 0°, 140 mm.t (9.09m) XWS, 0°, 18 mm.t (9.19m) CS, 0°, 30 mm.t	
					SHALE: dark grey, with light grey laminae, bedded at 0-5°.	FR	M			(9.46m) XWS, 0°, 4 mm.t (9.54m) XWS, 0°, 3 mm.t (9.60m) XWS, 0°, 2 mm.t (9.66m) XWS, 0°, 1 mm.t (9.76m) XWS, 0°, 3 mm.t	Ashfield Shale
		3	10							(9.91m) XWS, 0°, 14 mm.t	
		2	11				M - H			(10.42m) XWS, 0°, 14 mm.t	
					END OF BOREHOLE AT 11.27 m						
		1	12								
		0	13								
		-1									

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BOREHOLE LOG

Borehole No. 206

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~13.0 m
Date: 20/3/18 **Datum:** AHD
Plant Type: HYDROPOWER **Logged/Checked By:** A.C.K./A.J.

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
										CONCRETE: 130mm.t				6mm DIA. REINFORCEMENT 88mm TOP COVER
				■					-	FILL: Gravel, fine to medium grained, igneous, dark grey brown, with clay fines and silt fines.	M			
				■	N = 1 1,1,0					FILL: Silty clay, low to medium plasticity, grey, light grey and orange brown, trace of concrete fragments.	w>PL		45 45 50	CH4 0% LEL STRONG UNIDENTIFIABLE ODOUR
						12	1							
				■	N = 5 3,4,1					FILL: Silty gravelly clay, low plasticity, dark grey, fine to medium grained igneous gravel, with organic matter and slag fragments.			45	CH4 0% LEL APPEARS POORLY COMPACTED
						11	2							
										FILL: Slag fragments, dark grey.	M			
				■	N = 3 4,2,1	10	3							CH4 0% LEL
										FILL: Silty gravelly clay, low plasticity, dark grey, fine to medium grained igneous, with organic matter.	w>PL			
						9	4							
▶				■	N = 10 3,5,5				ML	Clayey SILT: low plasticity, light grey and light brown, with fine grained sand.	w>PL	F - St	70 85	CH4 0% LEL
												VSt - Hd	190 600 380	ALLUVIAL
						8	5							
									CH	Silty CLAY: high plasticity, light grey and light brown, trace of fine to medium grained ironstone gravel.		St - VSt		
				■	N = 19 3,8,11	7	6						260 305 190 175	

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Borehole No. 206
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BOREHOLE LOG

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~13.0 m
Date: 20/3/18 **Datum:** AHD
Plant Type: HYDROPOWER **Logged/Checked By:** A.C.K./A.J.

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
									CH	Silty CLAY: high plasticity, light grey and light brown, trace of fine to medium grained ironstone gravel. *(continued)*	w>PL	Hd		
				■	N > 42 8,17,25/ 110mm REFUSAL					Silty CLAY: high plasticity, light grey, with fine grained sand.			>600 580 480	
						5	8			REFER TO CORED BOREHOLE LOG				
						4	9							
						3	10							
						2	11							
						1	12							
						0	13							

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Borehole No. 206 3 / 3

CORED BOREHOLE LOG

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Core Size:** NMLC **R.L. Surface:** ~13.0 m
Date: 20/3/18 **Inclination:** VERTICAL **Datum:** AHD
Plant Type: HYDROPOWER **Bearing:** N/A **Logged/Checked By:** A.C.K./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$: VL -0.1, L -0.3, M -1, H -3, VH -10, EH	DEFECT DETAILS: SPACING (mm) 600 200 60 20	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
					START CORING AT 7.95m						
		5	8		NO CORE 0.61m						
		4	9		SHALE: dark grey, with brown laminae, bedded at 0-5°.	XW	Hd				
100% RETURN		3	10		SHALE: dark grey, with light grey laminae, bedded at 0-5°.	SW / FR	M			(9.25m) XWS, 0°, 8 mm.t (9.38m) CS, 0°, 10 mm.t (9.58m) XWS, 0°, 5 mm.t (9.69m) CS, 0°, 2 mm.t (9.76m) CS, 0°, 2 mm.t (10.02m) XWS, 0°, 7 mm.t (10.14m) XWS, 0°, 2 mm.t (10.45m) Cr, 0°, 60 mm.t	Ashfield Shale
		2	11								
		1	12								
		0	13		END OF BOREHOLE AT 12.56 m						

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 207
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BOREHOLE LOG

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~13.3 m
Date: 22/3/18 **Datum:** AHD
Plant Type: HYDROPOWER **Logged/Checked By:** T.P./A.J.

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
										CONCRETE: 150mm.t				7mm DIA. REINFORCEMENT 55mm & 110mm TOP COVER
						13			-	FILL: Sand, fine to coarse grained, orange brown, trace of fine to coarse grained sandstone gravel.	M			CH4 0% LEL
					N = 8 2,4,4					FILL: Sandy gravel, fine to coarse grained, sandstone, red brown and light grey, fine to course grained sand.	w<PL			
						12	1			FILL: Clayey silt, low plasticity, dark brown, trace of fine to coarse grained sandstone gravel, glass fragments and organic matter.				APPEARS POORLY COMPACTED
					N = 3 1,1,2						w>PL			CH4 0% LEL
ON COMPLETION OF AUGERING & CORING						11	2							
					N = 3 1,1,2	10	3							CH4 0% LEL
							4							
						9			CI-CH	Silty CLAY: medium to high plasticity, grey mottled orange brown, with fine to coarse grained ironstone gravel.	w>PL	VSt		ALLUVIAL
					N = 25 5,12,13		5						240 240 260	CH4 0% LEL
						8						St		
					N = 6 2,2,4	7	6						110 110 110	

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BOREHOLE LOG

Borehole No. 207

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~13.3 m
Date: 22/3/18 **Datum:** AHD
Plant Type: HYDROPOWER **Logged/Checked By:** T.P./A.J.

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
				■	N = 20 4,7,13	6			CI-CH	Silty CLAY: medium to high plasticity, grey mottled orange brown, with fine to coarse grained ironstone gravel. *(continued)*	w>PL	VSt		
						5	8		-	SHALE: grey and orange brown.	XW	Hd		EXTREMELY WEATHERED ROCK
						4	9			REFER TO CORED BOREHOLE LOG				
						3	10							
						2	11							
						1	12							
						0	13							

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Borehole No. 207 3 / 3

CORED BOREHOLE LOG

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Core Size:** NMLC **R.L. Surface:** ~13.3 m
Date: 22/3/18 **Inclination:** VERTICAL **Datum:** AHD
Plant Type: HYDROPOWER **Bearing:** N/A **Logged/Checked By:** T.P./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	DEFECT DETAILS: SPACING (mm) (600, 200, 60, 20)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
		5			START CORING AT 8.58m						
			9		NO CORE 1.18m						
100% RETURN		4									
			10		SHALE: grey, with dark grey laminae, bedded at 0-5°.	XW	Hd				Ashfield Shale
		3				SW	M			(10.07m) J, 85 - 90°, Un, R, Cn	
						FR				(10.57m) Cr, 0 - 3°, 15 mm.t	
										(10.75m) CS, 0 - 3°, 6 mm.t	
										(10.81m) CS, 0 - 3°, 2 mm.t	
			11				M - H			(10.93m) Be, 0 - 3°, 12 mm.t	
		2								(11.40m) CS, 0 - 3°, 15 mm.t	
										(11.86m) XWS, 0 - 3°, 14 mm.t	
			12							(12.00m) J, 85°, P, S, Cn	
		1								(12.23m) XWS, 0 - 3°, 18 mm.t	
			13		END OF BOREHOLE AT 12.98 m						
		0									
			14								
		-1									

JK 9.01.0 LIB.GLB Log JK CORED BOREHOLE - MASTER 31344ZA STRATHFIELDSOUTH.GPJ <<DrawingFile>> 07/05/2018 16:54 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: JK 9.01.0 2018-03-20 Prj: JK 9.01.0 2018-03-20

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JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 208
1 / 3

BOREHOLE LOG

Client: DOWNER

Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION

Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~13.3 m

Date: 21/3/18 **Datum:** AHD

Plant Type: HYDROPOWER **Logged/Checked By:** T.P./A.J.

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
									-	ASPHALTIC CONCRETE: 40mm.t	w>PL			
						13				FILL: Silty clay, medium plasticity, grey and brown, trace of fine to coarse grained ironstone gravel, fine grained sand, slag and ash.				
									CI-CH		w>PL	VSt		ALLUVIAL
					N = 7 2,2,5					Silty CLAY: medium to high plasticity, grey mottled orange brown, trace of fine to coarse grained ironstone gravel.			220 250 210	CH4 0% LEL
ON COMPLETION OF CORING							1							
						12						Hd		
					N = 21 4,8,13								>600 >600 >600	
ON COMPLETION OF AUGERING							2							
						11			ML	SILT: low plasticity, light grey mottled orange brown, trace of clay fines.	w<PL	St		
					N = 12 2,4,8		3							
						10								
							4		CL-CI	Silty CLAY: low to medium plasticity, orange brown mottled grey, with fine to coarse grained ironstone gravel.	w>PL	St - VSt		
					N = 11 2,5,6	9							250 150 210	
							5							
						8								
					N = 12 4,5,7		6						240 180 200	
						7								

JK 9.01.0 LIB:GLB Log JK AUGERHOLE - MASTER 31344ZA STRATHFIELDSOUTH.GPJ <<DrawingFile>> 07/05/2018 16:54 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: JK 9.01.0 2018-03-20 Prj: JK 9.01.0 2018-03-20

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BOREHOLE LOG

Borehole No. 208
2 / 3

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~13.3 m
Date: 21/3/18 **Datum:** AHD
Plant Type: HYDROPOWER **Logged/Checked By:** T.P./A.J.

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
						6			CL-CI	Silty CLAY: low to medium plasticity, orange brown mottled grey, with fine to coarse grained ironstone gravel. *(continued)*	w>PL	St - VSt		
				■	N > 20 9,20/ 150mm REFUSAL				-	SHALE: light grey and orange brown, with clay bands.	XW	Hd		EXTREMELY WEATHERED ROCK
						5	8			REFER TO CORED BOREHOLE LOG				
						4	9							
						3	10							
						2	11							
						1	12							
						0	13							

JK 9.01.0 LIB.GLB Log JK AUGERHOLE - MASTER 31344ZA STRATHFIELDSOUTH.GPJ <<DrawingFile>> 07/05/2018 16:54 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: JK 9.01.0 2018-03-20 Prj: JK 9.01.0 2018-03-20

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No.
208
3 / 3

CORED BOREHOLE LOG

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA | **Core Size:** NMLC | **R.L. Surface:** ~13.3 m
Date: 21/3/18 | **Inclination:** VERTICAL | **Datum:** AHD
Plant Type: HYDROPOWER | **Bearing:** N/A | **Logged/Checked By:** T.P./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	DEFECT DETAILS: SPACING (mm) (600, 200, 60, 20)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
		6			START CORING AT 7.92m						
100% RETURN		5	8		SHALE: grey, with iron indurated bands, and low strength bands.	XW - DW	Hd - VL				
		4	9								
		3	10		SHALE: grey, with dark grey laminae, bedded at 0-5°.	SW	M			(9.40m) J, 85 - 90°, Un, R, Cn (9.56m) XWS, 0 - 3°, 5 mm.t (9.66m) XWS, 0 - 3°, 10 mm.t (9.74m) XWS, 0 - 3°, 10 mm.t (9.75m) J, 90°, P, R, Cn (9.84m) J, 90°, P, R, Cn (9.85m) XWS, 0 - 3°, 3 mm.t (9.87m) XWS, 0 - 3°, 2 mm.t (9.89m) XWS, 0 - 3°, 4 mm.t (10.16m) XWS, 0 - 3°, 25 mm.t (10.21m) J, 85°, Un, R, Cn	Ashfield Shale
		2	11			FR				(10.74m) Be, 0°, P, S, Cn	
		1	12		END OF BOREHOLE AT 12.00 m						
		0	13								

JK 9.01.0 LIB GLB Log JK CORED BOREHOLE - MASTER 31344ZA STRATHFIELDSOUTH.GPJ <<DrawingFile>> 07/05/2018 16:54 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: JK 9.01.0 2018-03-20 Prj: JK 9.01.0 2018-03-20

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Appendix D: Laboratory Reports & COC Documents

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 188062

Client Details

Client	Environmental Investigation Services
Attention	Para Bokalawela
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E31344K, Strathfield South**
Number of Samples	19 Soil
Date samples received	26/03/2018
Date completed instructions received	26/03/2018

Analysis Details

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

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

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

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

Report Details

Date results requested by	04/04/2018
Date of Issue	03/04/2018

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

Results Approved By
Dragana Tomas, Senior Chemist
Jeremy Faircloth, Organics Supervisor
Long Pham, Team Leader, Metals
Paul Ching, Senior Analyst

Authorised By

Jacinta Hurst, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		188062-1	188062-2	188062-3	188062-4	188062-5
Your Reference	UNITS	BH201	BH201	BH202	BH202	BH203
Depth		0.2-0.3	0.8-1.0	0.2-0.3	1.0-1.2	0.2-0.3
Date Sampled		21/03/2018	21/03/2018	22/03/2018	22/03/2018	19/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	28/03/2018	28/03/2018	28/03/2018	28/03/2018	28/03/2018
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
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	75	87	77	79	76

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		188062-7	188062-8	188062-10	188062-13	188062-16
Your Reference	UNITS	BH205	BH205	BH205	BH207	BH207
Depth		0.1-0.2	1.0-1.1	3.4-3.5	0.2-0.3	2.9-3.0
Date Sampled		20/03/2018	20/03/2018	20/03/2018	22/03/2018	22/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	28/03/2018	28/03/2018	28/03/2018	28/03/2018	28/03/2018
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
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	77	72	72	75	75

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		188062-18
Your Reference	UNITS	BH208
Depth		0.2-0.3
Date Sampled		21/03/2018
Type of sample		Soil
Date extracted	-	27/03/2018
Date analysed	-	28/03/2018
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
naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	76

svTRH (C10-C40) in Soil						
Our Reference		188062-1	188062-2	188062-3	188062-4	188062-5
Your Reference	UNITS	BH201	BH201	BH202	BH202	BH203
Depth		0.2-0.3	0.8-1.0	0.2-0.3	1.0-1.2	0.2-0.3
Date Sampled		21/03/2018	21/03/2018	22/03/2018	22/03/2018	19/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	28/03/2018	30/03/2018	28/03/2018	28/03/2018	28/03/2018
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	%	83	84	85	85	87

svTRH (C10-C40) in Soil						
Our Reference		188062-7	188062-8	188062-10	188062-13	188062-16
Your Reference	UNITS	BH205	BH205	BH205	BH207	BH207
Depth		0.1-0.2	1.0-1.1	3.4-3.5	0.2-0.3	2.9-3.0
Date Sampled		20/03/2018	20/03/2018	20/03/2018	22/03/2018	22/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	28/03/2018	28/03/2018	28/03/2018	28/03/2018	28/03/2018
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	180	<100	<100	<100	150
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	230	<100	<100	<100	240
TRH >C_{34} -C_{40}	mg/kg	120	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	350	<50	<50	<50	240
Surrogate o-Terphenyl	%	86	84	85	83	87

svTRH (C10-C40) in Soil		
Our Reference		188062-18
Your Reference	UNITS	BH208
Depth		0.2-0.3
Date Sampled		21/03/2018
Type of sample		Soil
Date extracted	-	27/03/2018
Date analysed	-	28/03/2018
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	%	84

PAHs in Soil						
Our Reference		188062-1	188062-2	188062-3	188062-4	188062-5
Your Reference	UNITS	BH201	BH201	BH202	BH202	BH203
Depth		0.2-0.3	0.8-1.0	0.2-0.3	1.0-1.2	0.2-0.3
Date Sampled		21/03/2018	21/03/2018	22/03/2018	22/03/2018	19/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
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	<0.1	<0.1	<0.1	<0.1	0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
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	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	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
Surrogate p-Terphenyl-d14	%	106	114	106	112	106

PAHs in Soil						
Our Reference		188062-7	188062-8	188062-10	188062-13	188062-16
Your Reference	UNITS	BH205	BH205	BH205	BH207	BH207
Depth		0.1-0.2	1.0-1.1	3.4-3.5	0.2-0.3	2.9-3.0
Date Sampled		20/03/2018	20/03/2018	20/03/2018	22/03/2018	22/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Naphthalene	mg/kg	<0.1	<0.1	<0.1	0.2	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	0.2	<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	1.3	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	0.4	<0.1
Fluoranthene	mg/kg	0.2	<0.1	<0.1	1.9	<0.1
Pyrene	mg/kg	0.3	0.2	0.1	1.9	<0.1
Benzo(a)anthracene	mg/kg	0.2	<0.1	<0.1	1.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	0.6	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	1	<0.2
Benzo(a)pyrene	mg/kg	0.1	0.09	<0.05	0.97	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	0.8	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	0.2	<0.1
Benzo(g,h,i)perylene	mg/kg	0.1	0.1	0.1	0.8	<0.1
Total +ve PAH's	mg/kg	0.84	0.4	0.2	12	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	1.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	1.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	1.5	<0.5
Surrogate p-Terphenyl-d14	%	111	109	108	108	104

PAHs in Soil		
Our Reference		188062-18
Your Reference	UNITS	BH208
Depth		0.2-0.3
Date Sampled		21/03/2018
Type of sample		Soil
Date extracted	-	27/03/2018
Date analysed	-	27/03/2018
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
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
Total +ve PAH's	mg/kg	<0.05
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
Surrogate p-Terphenyl-d14	%	103

Organochlorine Pesticides in soil						
Our Reference		188062-1	188062-2	188062-3	188062-4	188062-5
Your Reference	UNITS	BH201	BH201	BH202	BH202	BH203
Depth		0.2-0.3	0.8-1.0	0.2-0.3	1.0-1.2	0.2-0.3
Date Sampled		21/03/2018	21/03/2018	22/03/2018	22/03/2018	19/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	27/03/2018	27/03/2018	28/03/2018	28/03/2018	28/03/2018
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	95	98	100	96	94

Organochlorine Pesticides in soil						
Our Reference		188062-7	188062-8	188062-10	188062-13	188062-16
Your Reference	UNITS	BH205	BH205	BH205	BH207	BH207
Depth		0.1-0.2	1.0-1.1	3.4-3.5	0.2-0.3	2.9-3.0
Date Sampled		20/03/2018	20/03/2018	20/03/2018	22/03/2018	22/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	28/03/2018	28/03/2018	28/03/2018	28/03/2018	28/03/2018
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	86	97	90	103	96

Organochlorine Pesticides in soil		
Our Reference		188062-18
Your Reference	UNITS	BH208
Depth		0.2-0.3
Date Sampled		21/03/2018
Type of sample		Soil
Date extracted	-	27/03/2018
Date analysed	-	28/03/2018
HCB	mg/kg	<0.1
alpha-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Surrogate TCMX	%	94

PCBs in Soil						
Our Reference		188062-1	188062-2	188062-3	188062-4	188062-5
Your Reference	UNITS	BH201	BH201	BH202	BH202	BH203
Depth		0.2-0.3	0.8-1.0	0.2-0.3	1.0-1.2	0.2-0.3
Date Sampled		21/03/2018	21/03/2018	22/03/2018	22/03/2018	19/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	27/03/2018	27/03/2018	28/03/2018	28/03/2018	28/03/2018
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	95	98	100	96	94

PCBs in Soil						
Our Reference		188062-7	188062-8	188062-10	188062-13	188062-16
Your Reference	UNITS	BH205	BH205	BH205	BH207	BH207
Depth		0.1-0.2	1.0-1.1	3.4-3.5	0.2-0.3	2.9-3.0
Date Sampled		20/03/2018	20/03/2018	20/03/2018	22/03/2018	22/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	28/03/2018	28/03/2018	28/03/2018	28/03/2018	28/03/2018
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	86	97	90	103	96

PCBs in Soil		
Our Reference		188062-18
Your Reference	UNITS	BH208
Depth		0.2-0.3
Date Sampled		21/03/2018
Type of sample		Soil
Date extracted	-	27/03/2018
Date analysed	-	28/03/2018
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate TCLMX	%	94

Acid Extractable metals in soil						
Our Reference		188062-1	188062-2	188062-3	188062-4	188062-5
Your Reference	UNITS	BH201	BH201	BH202	BH202	BH203
Depth		0.2-0.3	0.8-1.0	0.2-0.3	1.0-1.2	0.2-0.3
Date Sampled		21/03/2018	21/03/2018	22/03/2018	22/03/2018	19/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	28/03/2018	28/03/2018	28/03/2018	28/03/2018	28/03/2018
Arsenic	mg/kg	6	<4	5	<4	5
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	12	8	12	20	13
Copper	mg/kg	42	3	12	4	37
Lead	mg/kg	48	8	17	9	66
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	11	2	8	2	23
Zinc	mg/kg	65	5	46	5	60

Acid Extractable metals in soil						
Our Reference		188062-7	188062-8	188062-10	188062-13	188062-16
Your Reference	UNITS	BH205	BH205	BH205	BH207	BH207
Depth		0.1-0.2	1.0-1.1	3.4-3.5	0.2-0.3	2.9-3.0
Date Sampled		20/03/2018	20/03/2018	20/03/2018	22/03/2018	22/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	28/03/2018	28/03/2018	28/03/2018	28/03/2018	28/03/2018
Arsenic	mg/kg	8	6	12	<4	9
Cadmium	mg/kg	<0.4	<0.4	0.6	<0.4	6.1
Chromium	mg/kg	20	15	20	6	29
Copper	mg/kg	22	14	64	42	450
Lead	mg/kg	58	31	110	12	550
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Nickel	mg/kg	9	6	13	4	35
Zinc	mg/kg	70	28	170	51	790

Acid Extractable metals in soil			
Our Reference		188062-18	188062-20
Your Reference	UNITS	BH208	BH208 - [TRIPLICATE]
Depth		0.2-0.3	0.2-0.3
Date Sampled		21/03/2018	21/03/2018
Type of sample		Soil	Soil
Date prepared	-	27/03/2018	27/03/2018
Date analysed	-	28/03/2018	28/03/2018
Arsenic	mg/kg	6	9
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	10	12
Copper	mg/kg	11	15
Lead	mg/kg	30	22
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	5	7
Zinc	mg/kg	30	30

Moisture						
Our Reference		188062-1	188062-2	188062-3	188062-4	188062-5
Your Reference	UNITS	BH201	BH201	BH202	BH202	BH203
Depth		0.2-0.3	0.8-1.0	0.2-0.3	1.0-1.2	0.2-0.3
Date Sampled		21/03/2018	21/03/2018	22/03/2018	22/03/2018	19/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	28/03/2018	28/03/2018	28/03/2018	28/03/2018	28/03/2018
Moisture	%	14	15	16	21	18

Moisture						
Our Reference		188062-7	188062-8	188062-10	188062-13	188062-16
Your Reference	UNITS	BH205	BH205	BH205	BH207	BH207
Depth		0.1-0.2	1.0-1.1	3.4-3.5	0.2-0.3	2.9-3.0
Date Sampled		20/03/2018	20/03/2018	20/03/2018	22/03/2018	22/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	28/03/2018	28/03/2018	28/03/2018	28/03/2018	28/03/2018
Moisture	%	17	17	24	14	17

Moisture		
Our Reference		188062-18
Your Reference	UNITS	BH208
Depth		0.2-0.3
Date Sampled		21/03/2018
Type of sample		Soil
Date prepared	-	27/03/2018
Date analysed	-	28/03/2018
Moisture	%	19

Asbestos ID - soils						
Our Reference		188062-1	188062-3	188062-5	188062-7	188062-8
Your Reference	UNITS	BH201	BH202	BH203	BH205	BH205
Depth		0.2-0.3	0.2-0.3	0.2-0.3	0.1-0.2	1.0-1.1
Date Sampled		21/03/2018	22/03/2018	19/03/2018	20/03/2018	20/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	03/04/2018	03/04/2018	03/04/2018	03/04/2018	03/04/2018
Sample mass tested	g	Approx. 25g	Approx. 25g	Approx. 30g	Approx. 55g	Approx. 40g
Sample Description	-	Brown coarse-grained soil & rocks	Red coarse-grained soil & rocks	Brown coarse-grained soil & rocks	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	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	No asbestos detected

Asbestos ID - soils					
Our Reference		188062-10	188062-13	188062-16	188062-18
Your Reference	UNITS	BH205	BH207	BH207	BH208
Depth		3.4-3.5	0.2-0.3	2.9-3.0	0.2-0.3
Date Sampled		20/03/2018	22/03/2018	22/03/2018	21/03/2018
Type of sample		Soil	Soil	Soil	Soil
Date analysed	-	03/04/2018	03/04/2018	03/04/2018	03/04/2018
Sample mass tested	g	Approx. 20g	Approx. 30g	Approx. 20g	Approx. 35g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	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	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.

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	-			27/03/2018	1	27/03/2018	27/03/2018		27/03/2018	[NT]
Date analysed	-			28/03/2018	1	28/03/2018	28/03/2018		28/03/2018	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	<25	1	<25	<25	0	88	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	1	<25	<25	0	88	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	1	<0.2	<0.2	0	98	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	1	<0.5	<0.5	0	95	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	1	<1	<1	0	95	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	1	<2	<2	0	76	[NT]
o-Xylene	mg/kg	1	Org-016	<1	1	<1	<1	0	85	[NT]
naphthalene	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	88	1	75	78	4	89	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	18	27/03/2018	27/03/2018		[NT]	[NT]
Date analysed	-			[NT]	18	28/03/2018	28/03/2018		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	[NT]	18	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	[NT]	18	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-016	[NT]	18	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-016	[NT]	18	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-016	[NT]	18	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-016	[NT]	18	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-016	[NT]	18	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-014	[NT]	18	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	18	76	76	0	[NT]	[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	-			29/03/2018	1	27/03/2018	27/03/2018		27/03/2018	[NT]
Date analysed	-			29/03/2018	1	28/03/2018	30/03/2018		28/03/2018	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	1	<50	<50	0	103	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	1	<100	<100	0	94	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	1	<100	<100	0	92	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	1	<50	<50	0	103	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	1	<100	<100	0	94	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	1	<100	<100	0	92	[NT]
Surrogate o-Terphenyl	%		Org-003	80	1	83	84	1	93	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	18	27/03/2018	27/03/2018		[NT]	[NT]
Date analysed	-			[NT]	18	28/03/2018	28/03/2018		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	[NT]	18	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	[NT]	18	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	[NT]	18	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	[NT]	18	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	[NT]	18	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	[NT]	18	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-003	[NT]	18	84	84	0	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			27/03/2018	1	27/03/2018	27/03/2018		27/03/2018	[NT]
Date analysed	-			27/03/2018	1	27/03/2018	27/03/2018		27/03/2018	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	97	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	101	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	125	[NT]
Anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	99	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	101	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	84	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	1	<0.05	<0.05	0	105	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	115	1	106	102	4	120	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	18	27/03/2018	27/03/2018		[NT]	[NT]
Date analysed	-			[NT]	18	27/03/2018	27/03/2018		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-012	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-012	[NT]	18	<0.1	0.2	67	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-012	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	[NT]	18	<0.1	0.2	67	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-012	[NT]	18	<0.1	0.2	67	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	[NT]	18	<0.1	0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	[NT]	18	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	[NT]	18	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	[NT]	18	103	105	2	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			27/03/2018	1	27/03/2018	27/03/2018		27/03/2018	[NT]
Date analysed	-			27/03/2018	1	27/03/2018	27/03/2018		27/03/2018	[NT]
HCB	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	87	[NT]
gamma-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	80	[NT]
Heptachlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	74	[NT]
delta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	74	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	78	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	89	[NT]
Dieldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	95	[NT]
Endrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	85	[NT]
pp-DDD	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	72	[NT]
Endosulfan II	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	71	[NT]
Methoxychlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	84	1	95	81	16	104	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	18	27/03/2018	27/03/2018		[NT]	[NT]
Date analysed	-			[NT]	18	28/03/2018	28/03/2018		[NT]	[NT]
HCB	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	[NT]	18	94	102	8	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			27/03/2018	1	27/03/2018	27/03/2018		27/03/2018	[NT]
Date analysed	-			27/03/2018	1	27/03/2018	27/03/2018		27/03/2018	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	100	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	84	1	95	81	16	96	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	18	27/03/2018	27/03/2018		[NT]	[NT]
Date analysed	-			[NT]	18	28/03/2018	28/03/2018		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	[NT]	18	94	102	8	[NT]	[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	-			27/03/2018	1	27/03/2018	27/03/2018		27/03/2018	[NT]
Date analysed	-			28/03/2018	1	28/03/2018	28/03/2018		28/03/2018	[NT]
Arsenic	mg/kg	4	Metals-020	<4	1	6	7	15	114	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	105	[NT]
Chromium	mg/kg	1	Metals-020	<1	1	12	12	0	113	[NT]
Copper	mg/kg	1	Metals-020	<1	1	42	33	24	116	[NT]
Lead	mg/kg	1	Metals-020	<1	1	48	46	4	109	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	110	[NT]
Nickel	mg/kg	1	Metals-020	<1	1	11	11	0	112	[NT]
Zinc	mg/kg	1	Metals-020	<1	1	65	65	0	106	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	18	27/03/2018	27/03/2018		[NT]	[NT]
Date analysed	-			[NT]	18	28/03/2018	28/03/2018		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	18	6	8	29	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	18	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	18	10	12	18	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	18	11	18	48	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	18	30	15	67	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	18	5	5	0	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	18	30	22	31	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	16	27/03/2018	27/03/2018		[NT]	[NT]
Date analysed	-			[NT]	16	28/03/2018	28/03/2018		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	16	9	9	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	16	6.1	4.6	28	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	16	29	33	13	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	16	450	350	25	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	16	550	430	24	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	16	0.2	0.2	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	16	35	40	13	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	16	790	1100	33	[NT]	[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.

Report Comments

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 188062-18 for Pb. Therefore a triplicate result has been issued as laboratory sample number 188062-20.

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 requested for asbestos testing were sub-sampled from bags provided by the client.

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD	EIS Job Number: E31344K	ENVIRONMENTAL INVESTIGATION SERVICES
12 ASHLEY STREET		REAR OF 115 WICKS ROAD
CHATSWOOD NSW 2067		MACQUARIE PARK, NSW 2113
P: (02) 9910620[illegible]	Date Results Required: STANDARD	P: 02-9888 5000 F: 02-9888 5001
F: (02) 9910620[illegible]		Attention: Parra Bokalawea
Attention: Aileen	Page: 1/1	

Location: Strathfield South

Sampler: MT

Sample Preserved in Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 5a	Combo 5	Combo 6	Combo 6a	8 Metals	PAHs	TRH/BTEX	BTEX	Asbestos			
21/3/18		BH201	0.2-0.3	G, A	0	Fill	X											
↓		BH201	0.8-1.0	"	0	clay		X										
22/3/18		BH202	0.2-0.3	"	0	Fill	X											
↓		BH202	1.0-1.2	"	0	clay		X										
19/3/18		BH203	0.2-0.3	"	0	Fill	X											
19/3/18		BH203	1.5-1.8	"	0	Clay												
20/3/18		BH205	0.1-0.2	"	0	Fill	X											
		BH205	1.0-1.1	"	0	Fill	X											
		BH205	2.2-2.5	"	0	Fill												
		BH205	3.4-3.6	"	0	Fill	X											
		BH205	4.4-4.5	"	0	Fill												
		BH205	4.5-5.0	"	0	clay, silt												
22/3/18		BH207	0.2-0.3	"	0	Fill	X											
		BH207	1.0-1.1	"	0	Fill												
		BH207	1.7-2.0	"	0	Fill												
		BH207	2.9-3.0	"	0	Fill	X											
↓		BH207	4.3-4.5	"	0	clay												
21/3/18		BH208	0.2-0.3	"	0	Fill	X											
21/3/18		BH208	0.8-0.95	"	0	clay												

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

Job No: 180062
Date Received: 26.03.18
Time Received: 14:30
Received by: JE
Temp: Cool/Ambient 16.6°C
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:
MJ	26/3/18		ELS JE	26.03.18

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	Para Bokalawela

Sample Login Details

Your reference	E31344K, Strathfield South
Envirolab Reference	188062
Date Sample Received	26/03/2018
Date Instructions Received	26/03/2018
Date Results Expected to be Reported	04/04/2018

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	19 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	16.6
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	PCBsin Soil	Acid Extractable metalsin soil	Asbestos ID - soils	On Hold
BH201-0.2-0.3	✓	✓	✓	✓	✓	✓	✓	
BH201-0.8-1.0	✓	✓	✓	✓	✓	✓		
BH202-0.2-0.3	✓	✓	✓	✓	✓	✓	✓	
BH202-1.0-1.2	✓	✓	✓	✓	✓	✓		
BH203-0.2-0.3	✓	✓	✓	✓	✓	✓	✓	
BH203-1.5-1.8								✓
BH205-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	
BH205-1.0-1.1	✓	✓	✓	✓	✓	✓	✓	
BH205-2.2-2.5								✓
BH205-3.4-3.5	✓	✓	✓	✓	✓	✓	✓	
BH205-4.4-4.5								✓
BH205-4.5-5.0								✓
BH207-0.2-0.3	✓	✓	✓	✓	✓	✓	✓	
BH207-1.0-1.1								✓
BH207-1.7-2.0								✓
BH207-2.9-3.0	✓	✓	✓	✓	✓	✓	✓	
BH207-4.3-4.5								✓
BH208-0.2-0.3	✓	✓	✓	✓	✓	✓	✓	
BH208-0.8-0.95								✓

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.

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www.envirolab.com.au

CERTIFICATE OF ANALYSIS 188062-A

Client Details

Client	Environmental Investigation Services
Attention	Para Bokalawela
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E31344K, Strathfield South**
Number of Samples	19 Soil
Date samples received	26/03/2018
Date completed instructions received	06/04/2018

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	11/04/2018
Date of Issue	11/04/2018

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Results Approved By
Jeremy Faircloth, Organics Supervisor
Long Pham, Team Leader, Metals

Authorised By

Jacinta Hurst, Laboratory Manager

Metals in TCLP USEPA1311				
Our Reference		188062-A-10	188062-A-13	188062-A-16
Your Reference	UNITS	BH205	BH207	BH207
Depth		3.4-3.5	0.2-0.3	2.9-3.0
Date Sampled		20/03/2018	22/03/2018	22/03/2018
Type of sample		Soil	Soil	Soil
Date extracted	-	09/04/2018	09/04/2018	09/04/2018
Date analysed	-	09/04/2018	[NA]	09/04/2018
pH of soil for fluid# determ.	pH units	7.9	7.0	8.8
pH of soil TCLP (after HCl)	pH units	1.7	1.6	1.6
Extraction fluid used	-	1	1	1
pH of final Leachate	pH units	5.1	4.9	5.0
Lead in TCLP	mg/L	0.1	[NA]	0.2

PAHs in TCLP (USEPA 1311)		
Our Reference		188062-A-13
Your Reference	UNITS	BH207
Depth		0.2-0.3
Date Sampled		22/03/2018
Type of sample		Soil
Date extracted	-	10/04/2018
Date analysed	-	10/04/2018
Naphthalene in TCLP	mg/L	<0.001
Acenaphthylene in TCLP	mg/L	<0.001
Acenaphthene in TCLP	mg/L	<0.001
Fluorene in TCLP	mg/L	<0.001
Phenanthrene in TCLP	mg/L	<0.001
Anthracene in TCLP	mg/L	<0.001
Fluoranthene in TCLP	mg/L	<0.001
Pyrene in TCLP	mg/L	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001
Chrysene in TCLP	mg/L	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001
Total +ve PAH's	mg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	137

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.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-012	Leachates are extracted with Dichloromethane and analysed by GC-MS.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.

QUALITY CONTROL: Metals in TCLP USEPA1311						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			09/04/2018	[NT]	[NT]	[NT]	[NT]	09/04/2018	[NT]
Date analysed	-			09/04/2018	[NT]	[NT]	[NT]	[NT]	09/04/2018	[NT]
Lead in TCLP	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	[NT]	[NT]	93	[NT]

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			10/04/2018	[NT]	[NT]	[NT]	[NT]	10/04/2018	[NT]
Date analysed	-			10/04/2018	[NT]	[NT]	[NT]	[NT]	10/04/2018	[NT]
Naphthalene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	75	[NT]
Acenaphthylene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	88	[NT]
Phenanthrene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	90	[NT]
Anthracene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	97	[NT]
Pyrene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	101	[NT]
Benzo(a)anthracene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	91	[NT]
Benzo(bjk)fluoranthene in TCLP	mg/L	0.002	Org-012	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	93	[NT]
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	129	[NT]	[NT]	[NT]	[NT]	110	[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.

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	Para Bokalawela

Sample Login Details

Your reference	E31344K, Strathfield South
Envirolab Reference	188062-A
Date Sample Received	26/03/2018
Date Instructions Received	06/04/2018
Date Results Expected to be Reported	11/04/2018

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	19 Soil
Turnaround Time Requested	3 days
Temperature on Receipt (°C)	16.6
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	Metals in TCLP USEPA1311	PAHs in TCLP(USEPA 1311)	On Hold
BH201-0.2-0.3			✓
BH201-0.8-1.0			✓
BH202-0.2-0.3			✓
BH202-1.0-1.2			✓
BH203-0.2-0.3			✓
BH203-1.5-1.8			✓
BH205-0.1-0.2			✓
BH205-1.0-1.1			✓
BH205-2.2-2.5			✓
BH205-3.4-3.5	✓		
BH205-4.4-4.5			✓
BH205-4.5-5.0			✓
BH207-0.2-0.3	✓	✓	
BH207-1.0-1.1			✓
BH207-1.7-2.0			✓
BH207-2.9-3.0	✓		
BH207-4.3-4.5			✓
BH208-0.2-0.3			✓
BH208-0.8-0.95			✓
BH208 - [TRIPLICATE]-0.2-0.3			✓

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

Additional Info

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

Andrew Fitzsimons

From: Nancy Zhang
Sent: Friday, 6 April 2018 2:11 PM
To: Para Bokalawela
Cc: Jacinta Hurst; Samplereceipt
Subject: RE: TCLP Request --- 188062 E31344K, Strathfield South

Hi Para,

No problem.

ELS: 188062-A
Due: 11/4/18
TAT: 3 days

Regards,

Nancy Zhang | Assistant Lab Manager | Envirolab Services Pty Ltd

Great Science, Great Service.

12 Ashley Street Chatswood NSW 2067
T 612 9910 6200 **F** 612 9910 6201
E nzhang@envirolab.com.au | **W** www.envirolab.com.au

Please note that all samples submitted to the Envirolab Group laboratories will be analysed under the Envirolab Group Terms and Conditions. The Terms and Conditions are accessible by clicking this link

---

From: Para Bokalawela [mailto:PBokalawela@jkgroup.net.au]
Sent: Friday, 6 April 2018 12:47 PM
To: Nancy Zhang <NZhang@envirolab.com.au>
Cc: Jacinta Hurst <JHurst@envirolab.com.au>
Subject: TCLP Request --- 188062 E31344K, Strathfield South

Hi,

Please do TCLP for the following in **3 day TAT** if possible:

- BH205 (3.4-3.5) – Lead -10
- BH207 (0.2-0.3) – B(a)P -13
- BH207 (2.9-3.0) 0 Lead -16

Regards,

Para Bokalawela

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
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customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 188074

Client Details

Client	Environmental Investigation Services
Attention	Para Bokalawela
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E31344K, Strathfield South**
Number of Samples	26 Soil
Date samples received	26/03/2018
Date completed instructions received	26/03/2018

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	04/04/2018
Date of Issue	04/04/2018

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

Results Approved By
Priya Samarawickrama, Senior Chemist

Authorised By

Jacinta Hurst, Laboratory Manager

sPOCAS + %S w/w						
Our Reference		188074-2	188074-6	188074-8	188074-9	188074-12
Your Reference	UNITS	BH202	BH202	BH203	BH203	BH203
Depth		1.0-1.2	5.8-6.0	0.5-0.95	1.8-1.95	6.3-6.5
Date Sampled		22/03/2018	22/03/2018	19/03/2018	19/03/2018	19/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
pH $_{kcl}$	pH units	4.1	5.6	7.8	5.2	6.5
TAA pH 6.5	moles H^+ /t	61	<5	<5	<5	<5
s-TAA pH 6.5	%w/w S	0.1	<0.01	<0.01	<0.01	<0.01
pH $_{Ox}$	pH units	4.3	6.4	7.5	6.4	3.7
TPA pH 6.5	moles H^+ /t	78	<5	<5	<5	15
s-TPA pH 6.5	%w/w S	0.12	<0.01	<0.01	<0.01	0.02
TSA pH 6.5	moles H^+ /t	16	<5	<5	<5	15
s-TSA pH 6.5	%w/w S	0.03	<0.01	<0.01	<0.01	0.02
ANC_E	% $CaCO_3$	<0.05	<0.05	0.38	<0.05	<0.05
a-ANC_E	moles H^+ /t	<5	<5	75	<5	<5
s-ANC_E	%w/w S	<0.05	<0.05	0.12	<0.05	<0.05
S_{KCl}	%w/w S	0.02	<0.005	0.01	<0.005	0.01
S_P	%w/w	0.02	<0.005	0.03	<0.005	0.07
S_{POS}	%w/w	<0.005	<0.005	0.02	<0.005	0.06
a-S_{POS}	moles H^+ /t	<5	<5	14	<5	35
Ca_{KCl}	%w/w	0.1	0.01	0.25	0.08	0.14
Ca_P	%w/w	0.08	0.01	0.24	0.07	0.15
Ca_A	%w/w	<0.005	<0.005	<0.005	<0.005	0.018
Mg_{KCl}	%w/w	0.052	0.051	0.066	0.084	0.29
Mg_P	%w/w	0.040	0.047	0.063	0.077	0.31
Mg_A	%w/w	<0.005	<0.005	<0.005	<0.005	0.019
S_{HCl}	%w/w S	0.018	<0.005	<0.005	<0.005	<0.005
S_{NAS}	%w/w S	<0.005	<0.005	<0.005	<0.005	<0.005
a-S_{NAS}	moles H^+ /t	<5	<5	<5	<5	<5
s-S_{NAS}	%w/w S	<0.01	<0.01	<0.01	<0.01	<0.01
Fineness Factor	-	1.5	1.5	1.5	1.5	1.5
a-Net Acidity	moles H^+ /t	63	<5	<5	<5	22
s-Net Acidity	%w/w S	0.10	<0.01	<0.01	<0.01	0.04
Liming rate	kg $CaCO_3$ /t	4.7	<0.75	<0.75	<0.75	1.6
s-Net Acidity without -ANCE	%w/w S	0.10	<0.01	0.022	<0.01	0.040
a-Net Acidity without ANCE	moles H^+ /t	63	<5	14	<5	22
Liming rate without ANCE	kg $CaCO_3$ /t	4.7	<0.75	1.0	<0.75	1.6

sPOCAS + %S w/w				
Our Reference		188074-13	188074-18	188074-25
Your Reference	UNITS	BH203	BH205	BH207
Depth		7.5-7.85	4.4-4.5	4.3-4.4
Date Sampled		19/03/2018	20/03/2018	22/03/2018
Type of sample		Soil	Soil	Soil
Date prepared	-	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	27/03/2018	27/03/2018	27/03/2018
pH $_{kcl}$	pH units	7.4	8.5	7.6
TAA pH 6.5	moles H^+ /t	<5	<5	<5
s-TAA pH 6.5	%w/w S	<0.01	<0.01	<0.01
pH $_{Ox}$	pH units	7.2	7.7	7.7
TPA pH 6.5	moles H^+ /t	<5	<5	<5
s-TPA pH 6.5	%w/w S	<0.01	<0.01	<0.01
TSA pH 6.5	moles H^+ /t	<5	<5	<5
s-TSA pH 6.5	%w/w S	<0.01	<0.01	<0.01
ANC_E	% $CaCO_3$	0.69	0.50	0.38
a-ANC_E	moles H^+ /t	140	100	75
s-ANC_E	%w/w S	0.22	0.16	0.12
S_{KCl}	%w/w S	0.01	0.02	0.007
S_P	%w/w	0.03	0.09	0.01
S_{POS}	%w/w	0.02	0.06	0.006
a-S_{POS}	moles H^+ /t	12	39	<5
Ca_{KCl}	%w/w	0.05	0.40	0.16
Ca_P	%w/w	0.07	0.37	0.18
Ca_A	%w/w	0.016	<0.005	0.021
Mg_{KCl}	%w/w	0.077	0.041	0.046
Mg_P	%w/w	0.080	0.040	0.050
Mg_A	%w/w	<0.005	<0.005	0.005
S_{HCl}	%w/w S	<0.005	<0.005	<0.005
S_{NAS}	%w/w S	<0.005	<0.005	<0.005
a-S_{NAS}	moles H^+ /t	<5	<5	<5
s-S_{NAS}	%w/w S	<0.01	<0.01	<0.01
Fineness Factor	-	1.5	1.5	1.5
a-Net Acidity	moles H^+ /t	<5	<5	<5
s-Net Acidity	%w/w S	<0.01	<0.01	<0.01
Liming rate	kg $CaCO_3$ /t	<0.75	<0.75	<0.75
s-Net Acidity without -ANCE	%w/w S	0.019	0.063	<0.01
a-Net Acidity without ANCE	moles H^+ /t	12	39	<5
Liming rate without ANCE	kg $CaCO_3$ /t	0.89	2.9	<0.75

Method ID	Methodology Summary
Inorg-064	sPOCAS determined using titrimetric and ICP-AES techniques. Based on Acid Sulfate Soils Laboratory Methods Guidelines, Version 2.1 - June 2004.

QUALITY CONTROL: sPOCAS + %S w/w						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			27/03/2018	2	27/03/2018	27/03/2018		27/03/2018	[NT]
Date analysed	-			27/03/2018	2	27/03/2018	27/03/2018		27/03/2018	[NT]
pH $_{kcl}$	pH units		Inorg-064	[NT]	2	4.1	4.1	0	91	[NT]
TAA pH 6.5	moles H^+ /t	5	Inorg-064	<5	2	61	61	0	95	[NT]
s-TAA pH 6.5	%w/w S	0.01	Inorg-064	<0.01	2	0.1	0.1	0	[NT]	[NT]
pH $_{Ox}$	pH units		Inorg-064	[NT]	2	4.3	4.4	2	106	[NT]
TPA pH 6.5	moles H^+ /t	5	Inorg-064	<5	2	78	85	9	88	[NT]
s-TPA pH 6.5	%w/w S	0.01	Inorg-064	<0.01	2	0.12	0.14	15	[NT]	[NT]
TSA pH 6.5	moles H^+ /t	5	Inorg-064	<5	2	16	24	40	[NT]	[NT]
s-TSA pH 6.5	%w/w S	0.01	Inorg-064	<0.01	2	0.03	0.04	29	[NT]	[NT]
ANC_E	% $CaCO_3$	0.05	Inorg-064	<0.05	2	<0.05	<0.05	0	[NT]	[NT]
a-ANC_E	moles H^+ /t	5	Inorg-064	<5	2	<5	<5	0	[NT]	[NT]
s-ANC_E	%w/w S	0.05	Inorg-064	<0.05	2	<0.05	<0.05	0	[NT]	[NT]
S_{KCl}	%w/w S	0.005	Inorg-064	<0.005	2	0.02	0.02	0	[NT]	[NT]
S_P	%w/w	0.005	Inorg-064	<0.005	2	0.02	0.02	0	[NT]	[NT]
S_{POS}	%w/w	0.005	Inorg-064	<0.005	2	<0.005	<0.005	0	[NT]	[NT]
a-S_{POS}	moles H^+ /t	5	Inorg-064	<5	2	<5	<5	0	[NT]	[NT]
Ca_{KCl}	%w/w	0.005	Inorg-064	<0.005	2	0.1	0.08	22	[NT]	[NT]
Ca_P	%w/w	0.005	Inorg-064	<0.005	2	0.08	0.08	0	[NT]	[NT]
Ca_A	%w/w	0.005	Inorg-064	<0.005	2	<0.005	0.005	0	[NT]	[NT]
Mg_{KCl}	%w/w	0.005	Inorg-064	<0.005	2	0.052	0.040	26	[NT]	[NT]
Mg_P	%w/w	0.005	Inorg-064	<0.005	2	0.040	0.040	0	[NT]	[NT]
Mg_A	%w/w	0.005	Inorg-064	<0.005	2	<0.005	<0.005	0	[NT]	[NT]
S_{HCl}	%w/w S	0.005	Inorg-064	<0.005	2	0.018	0.018	0	[NT]	[NT]
S_{NAS}	%w/w S	0.005	Inorg-064	<0.005	2	<0.005	<0.005	0	[NT]	[NT]
a-S_{NAS}	moles H^+ /t	5	Inorg-064	<5	2	<5	<5	0	[NT]	[NT]
s-S_{NAS}	%w/w S	0.01	Inorg-064	<0.01	2	<0.01	<0.01	0	[NT]	[NT]
Fineness Factor	-	1.5	Inorg-064	<1.5	2	1.5	1.5	0	[NT]	[NT]
a-Net Acidity	moles H^+ /t	5	Inorg-064	<5	2	63	64	2	[NT]	[NT]
s-Net Acidity	%w/w S	0.01	Inorg-064	<0.01	2	0.10	0.10	0	[NT]	[NT]
Liming rate	kg $CaCO_3$ /t	0.75	Inorg-064	<0.75	2	4.7	4.8	2	[NT]	[NT]
s-Net Acidity without -ANCE	%w/w S	0.01	Inorg-064	<0.01	2	0.10	0.10	0	[NT]	[NT]
a-Net Acidity without ANCE	moles H^+ /t	5	Inorg-064	<5	2	63	64	2	[NT]	[NT]

QUALITY CONTROL: sPOCAS + %S w/w						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Liming rate without ANCE	kg $CaCO_3$/t	0.75	Inorg-064	<0.75	2	4.7	4.8	2	[NT]	[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: E31344K	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) 9910620	Page: 1/2	Attention: Parra Bokalawea
Attention: Aileen		

Location: Strathfield South

Sampler: TP

Sample Preserved in Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Specs										
22/3/18	1	BH202	0.2-0.3	P	NA	Fill											
	2	BH202	1.0-1.2			silty clay	X										
	3	BH202	2.2-2.4														
	4	BH202	3.3-3.45														
	5	BH202	4.3-4.5														
	6	BH202	5.8-6.0				X										
	7	BH202	7.3-7.5														
19/3/18	8	BH203	0.5-0.65	P	NA	Fill	X										
	9	BH203	1.5-1.95			silty clay	X										
	10	BH203	3.0-3.45														
	11	BH203	4.5-4.95														
	12	BH203	6.3-6.45				X										
	13	BH203	7.5-7.85				X										
20/3/18	14	BH205	0-0.05			Fill											
	15	BH205	1.0-1.5			Fill											
	16	BH205	2.0-2.5			Fill											
	17	BH205	3.4-3.5			Fill											
	18	BH205	4.4-4.5			clay/silt	X										
	19	BH205	5.5-6.0			silty clay											
	20	BH205	7.2-7.5			"											
22/3/18	21	BH207	0.2-0.3			Fill											
	22	BH207	1.0-1.1			Fill											
	23	BH207	1.9-2.0			Fill											
	24	BH207	2.9-3.0			Fill											
	25	BH207	4.3-4.4			silty clay	X										

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

Job No: 188074

Date Received: 26/3/18

Time Received: 15:00

Received by: JE

Temp: Cool/Ambient 0.5°C

Cooling: Ice/Ice Pack

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:
MO	26/3/18		ELS JE	26/3/18

19074

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD	EIS Job Number: E31344K	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: 2/2	Attention: Parra Bokalawea
Attention: Aileen		

Location: Strathfield South

Sampler: TB

Sample Preserved in Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Spocas										
22/3/18	26	BH207	0.0-0.5	A	—	silty clay											

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:
MD	26/3/18.		ELS JE	26/3/18

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	Para Bokalawela

Sample Login Details

Your reference	E31344K, Strathfield South
Envirolab Reference	188074
Date Sample Received	26/03/2018
Date Instructions Received	26/03/2018
Date Results Expected to be Reported	04/04/2018

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	26 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	0.5
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
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Sample ID	sPOCAS + %S w/w	On Hold
BH202-0.2-0.3		✓
BH202-1.0-1.2	✓	
BH202-2.2-2.4		✓
BH202-3.3-3.45		✓
BH202-4.3-4.5		✓
BH202-5.8-6.0	✓	
BH202-7.3-7.5		✓
BH203-0.5-0.95	✓	
BH203-1.8-1.95	✓	
BH203-3.0-3.45		✓
BH203-4.5-4.95		✓
BH203-6.3-6.5	✓	
BH203-7.5-7.85	✓	
BH205-0.4-0.5		✓
BH205-1.4-1.5		✓
BH205-2.0-2.5		✓
BH205-3.4-3.5		✓
BH205-4.4-4.5	✓	
BH205-5.5-6.0		✓
BH205-7.2-7.5		✓
BH207-0.2-0.3		✓
BH207-1.0-1.1		✓
BH207-1.9-2.0		✓
BH207-2.9-3.0		✓
BH207-4.3-4.4	✓	
BH207-6.0-6.45		✓

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.

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CERTIFICATE OF ANALYSIS 188074-A

Client Details

Client	Environmental Investigation Services
Attention	Para Bokalawela
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E31344K, Strathfield South**
Number of Samples	26 Soil
Date samples received	26/03/2018
Date completed instructions received	23/04/2018

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	26/04/2018
Date of Issue	26/04/2018

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

Results Approved By
Nick Sarlamis, Inorganics Supervisor

Authorised By

Jacinta Hurst, Laboratory Manager

SCr			
Our Reference		188074-A-12	188074-A-18
Your Reference	UNITS	BH203	BH205
Depth		6.3-6.5	4.4-4.5
Date Sampled		19/03/2018	20/03/2018
Type of sample		Soil	Soil
Date prepared	-	26/04/2018	26/04/2018
Date analysed	-	26/04/2018	26/04/2018
Chromium Reducible Sulfur	%w/w	0.006	0.05
a-Chromium Reducible Sulfur	moles H^+ /t	4	33

Method ID	Methodology Summary
Inorg-068	Chromium Reducible Sulfur - Hydrogen Sulfide is quantified by iodometric titration after distillation to determine potential acidity. Based on Acid Sulfate Soils Laboratory Methods Guidelines, Version 2.1 - June 2004.

QUALITY CONTROL: SCr						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			26/04/2018	[NT]	[NT]	[NT]	[NT]	26/04/2018	[NT]
Date analysed	-			26/04/2018	[NT]	[NT]	[NT]	[NT]	26/04/2018	[NT]
Chromium Reducible Sulfur	%w/w	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	104	[NT]
a-Chromium Reducible Sulfur	moles H^+ /t	3	Inorg-068	<3	[NT]	[NT]	[NT]	[NT]	[NT]	[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.

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customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Environmental Investigation Services
Attention	Para Bokalawela

Sample Login Details

Your reference	E31344K, Strathfield South
Envirolab Reference	188074-A
Date Sample Received	26/03/2018
Date Instructions Received	23/04/2018
Date Results Expected to be Reported	26/04/2018

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	26 Soil
Turnaround Time Requested	2 days
Temperature on Receipt (°C)	0.5
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:

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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	SCr	On Hold
BH202-0.2-0.3		✓
BH202-1.0-1.2		✓
BH202-2.2-2.4		✓
BH202-3.3-3.45		✓
BH202-4.3-4.5		✓
BH202-5.8-6.0		✓
BH202-7.3-7.5		✓
BH203-0.5-0.95		✓
BH203-1.8-1.95		✓
BH203-3.0-3.45		✓
BH203-4.5-4.95		✓
BH203-6.3-6.5	✓	
BH203-7.5-7.85		✓
BH205-0.4-0.5		✓
BH205-1.4-1.5		✓
BH205-2.0-2.5		✓
BH205-3.4-3.5		✓
BH205-4.4-4.5	✓	
BH205-5.5-6.0		✓
BH205-7.2-7.5		✓
BH207-0.2-0.3		✓
BH207-1.0-1.1		✓
BH207-1.9-2.0		✓
BH207-2.9-3.0		✓
BH207-4.3-4.4		✓
BH207-6.0-6.45		✓

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.

Andrew Fitzsimons

From: Nancy Zhang
Sent: Monday, 23 April 2018 3:56 PM
To: Samplereceipt
Cc: Ken Nguyen
Subject: FW: 48hr TAT --- Additional Analysis Request --- 188074 E31344K, Strathfield South

ELS: 188074-A
TAT: 2 days
Due: 26/4/18

Regards,

Nancy Zhang | Assistant Lab Manager | Envirolab Services Pty Ltd

Great Science, Great Service.

12 Ashley Street Chatswood NSW 2067
T 612 9910 6200 **F** 612 9910 6201
E nzhang@envirolab.com.au | **W** www.envirolab.com.au

Please note that all samples submitted to the Envirolab Group laboratories will be analysed under the Envirolab Group Terms and Conditions. The Terms and Conditions are accessible by clicking this link

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From: Para Bokalawela [mailto:PBokalawela@jkgroup.net.au]
Sent: Monday, 23 April 2018 3:41 PM
To: Ken Nguyen <KNguyen@envirolab.com.au>; enquiries <enquiries@envirolab.com.au>
Subject: 48hr TAT --- Additional Analysis Request --- 188074 E31344K, Strathfield South

Hi,

Please analyse following two samples for "Scr – Chromium reducible" in **48hr TAT**:

- BH203 (6.3-6.5) - 12
- BH205 (4.4-4.5) - 18

Regards,

Para Bokalawela
Senior Environmental Engineer

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

ENVIRONMENTAL INVESTIGATION SERVICES

6 April 2018
Report Ref: E29667KGlet-WC

Downer Group
Unit 2, 16 Galleghan Street
Hexham, NSW 2322

Attention: Kari Torpstorm

WASTE CLASSIFICATION ASSESSMENT
PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION DEVELOPMENT
DEAN RESERVE, 146 STREET, STRATHFIELD SOUTH, NSW 2136

1 INTRODUCTION

Downer Group ('the client') commissioned Environmental Investigation Services (EIS)[1] to assign a waste classification to the in-situ soil located at Dean Reserve located off 146 Dean Street, Strathfield South NSW. The site location is shown on Figure 1 and sampling for the assessment 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: EP46779KD) of 13 March 2018 and written acceptance from the client by of 16 March 2018.

1.1 Proposed Development Details

EIS understand that the proposed development includes the construction of a new zone substation comprising of a single storey switch and control building for 11kV and 132kV switchgear at 7-9 Dunlop Street, Strathfield South. Part of the development will include excavation trenching for underground electrical services within Dean Reserve. EIS understand that the trenching will not extend any deeper than 1.5m below the existing ground levels. The details of the proposed development were not available to EIS at the time of the preparation of this report.

EIS have undertaken an Environmental Site Assessment for the site and a report (Ref: E29667Krpt) was issued on 28 October 2016[3].

[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] EIS 2016 Report

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:	Off 146 Dean Street, Strathfield South NSW 2136
Lot & Deposited Plan:	Lot C DP30006
Current Land Use:	Recreational
Approximate Area Applicable to Waste Classification (m^2):	1,700
Geographical Location (approx.):	Latitude: -33.895622 Longitude: 151.079092

The site is located in a predominantly residential and commercial/industrial area of Strathfield South. The site is bounded by the Cooks River to the South. The site is located in gently undulating regional topography on a south east facing hillside generally sloping down at 2° and increasing to 5° within the south eastern corner of the site. Minor undulations and changes in slope (<2°) exist across the site. A 15m wide embankment sloping at 6° south runs parallel to the southern boundary of the site which is marked by a concrete lined canal (Cooks River), 8.8m wide and 2.4m below ground surface level with sub vertical sides.

Site features – The site was located towards the eastern part of Dean Reserve. At the time of the inspection Dean Reserve was predominantly grass covered with minor concrete pavement paths and landscaped gardens. Children's play equipment, amenities building and covered seating areas occupied the central portions of the reserve. Small to medium sized trees and shrubs, in relatively good health, were observed scattered across the reserve and around the perimeter.

Site surrounds – Neighbouring properties to the east were occupied by various one and two storey industrial/commercial buildings. Neighbouring properties to the north were occupied by numerous two storey brick residential buildings. The Cooks River was located to the south and west of Dean Reserve.

2.2 Background/Historical Information

EIS has undertaken a preliminary historical assessment based on a review of the following information:

- The 1943 and 2016 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 1943 aerial photograph, EIS are of the opinion that the land use at the site appeared to be a quarry and apparently backfilled to form the existing Dean Reserve. Deep fill encountered in the test-pits further confirmed this. There were no records for the site on the NSW EPA contaminated land registers.

Considering the above information, the waste classification assessment will consider a broad suite of potential contaminants as outlined in Section 4.3.

2.3 Regional Geology

Regional geological information presented in the Lotsearch report presented in the EIS 2016 report indicated that the site is underlain by Quaternary aged deposits of silty to peaty quartz sand, silt, and clay with ferruginous and humic cementation in places and common shell layers.

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)[6] 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)	• If Specific Contaminant Concentration (SCC) ≤ Contaminant Threshold (CT1) then Toxicity Characteristics Leaching Procedure (TCLP) not needed to classify the soil as general solid waste; • If TCLP ≤ TCLP1 and SCC ≤ SCC1 then treat as general solid waste
Restricted Solid Waste (non-putrescible)	• If SCC ≤ CT2 then TCLP not needed to classify the soil as restricted solid waste; and • If TCLP ≤ TCLP2 and SCC ≤ SCC2 then treat as restricted solid waste

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

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

[6] Protection of Environment Operations Act 1997 (NSW) (POEO Act 1997)

Category	Description
Hazardous Waste	• If SCC > CT2 then TCLP not needed to classify the soil as hazardous waste; and • If TCLP > TCLP2 and/or SCC > SCC2 then treat as hazardous waste.
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 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 on 19 March 2018 and 20 March 2018. Soil samples were obtained from 3 test pits excavated for the geotechnical investigation by JK Geotechnics. The sampling locations are shown on Figure 2 attached in the appendices. The investigation was limited to a maximum depth of 1.2m due to test-pit refusal.

The sample locations were excavated using an excavator. Soil samples were obtained directly from the excavator bucket.

Soil samples were collected from the fill profiles encountered during the investigation. Environmental logs for two test-pits (TP301 and TP302) excavated on 19 March 2018 are attached in the appendices. Test pit TP303, excavated on 20 March 2018 had not been logged. EIS assume that the fill material in the TP303 is similar the fill in two other test pits.

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 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[7] 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.

4.3 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.

Three (3) 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); and
- Asbestos.

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[8]). Reference should be made to the laboratory reports (Ref: 187710) attached in the appendices for further information.

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

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

5 RESULTS OF THE INVESTIGATION

5.1 Subsurface Conditions

Fill soils were encountered in all test pits and extended from the surface to the termination of the test pits. The fill material typically consisted of brown silty clay with inclusions of gravel, root fibres, ash and slag. Natural soil or bedrock was not encountered in all test-pits. The maximum depth of the test-pits was 1.2m below the ground level. Reference should be made to the test-pit logs attached in the appendices for further details.

5.2 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 5-1: 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	3	0	0	All results were below the CT1 criteria
TRH	3	0	0	All results were below the laboratory practical quantitation limits (PQLs).
BTEX	3	0	0	All results were below the laboratory PQLs.
Total PAHs	3	0	0	All results were below the CT1 criteria.
Benzo(a)pyrene	3	0	0	All results were below the CT1 criterion.
OCPs & OPPs	3	0	0	All results were below the laboratory PQLs
PCBs	3	0	0	All results were below the laboratory PQLs
Asbestos	3	0	0	Asbestos was not detected in the samples analysed.

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 Recommendations

Any unexpected finds encountered during the site works should be inspected by a suitably qualified contaminated land consultant[9]. 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.

Should significant quantities of fill material require disposal or the excavation depth is greater than 2m below the existing ground level, EIS consider that further assessment will be required to adequately assess and classify the fill material at the site.

6.3 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.

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.

[9] EIS recommend that the consultancy engaged for the work be a member of the Australian Contaminated Land Consultants Associated (ACLCA), and/or the individual undertaking the works be certified under one of the NSW EPA endorsed certified practitioner schemes

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,

Para Bokalawela
Senior Environmental Engineer

Adrian Kingswell
Principal

Appendices:

Appendix A: Report Figures
Appendix B: Laboratory Summary Tables
Appendix C: Test pit Logs
Appendix D: Laboratory Report & 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**

Project: DEAN RESERVE, DEAN STREET
STRATHFIELD SOUTH, NSW

Report No: E29667KG

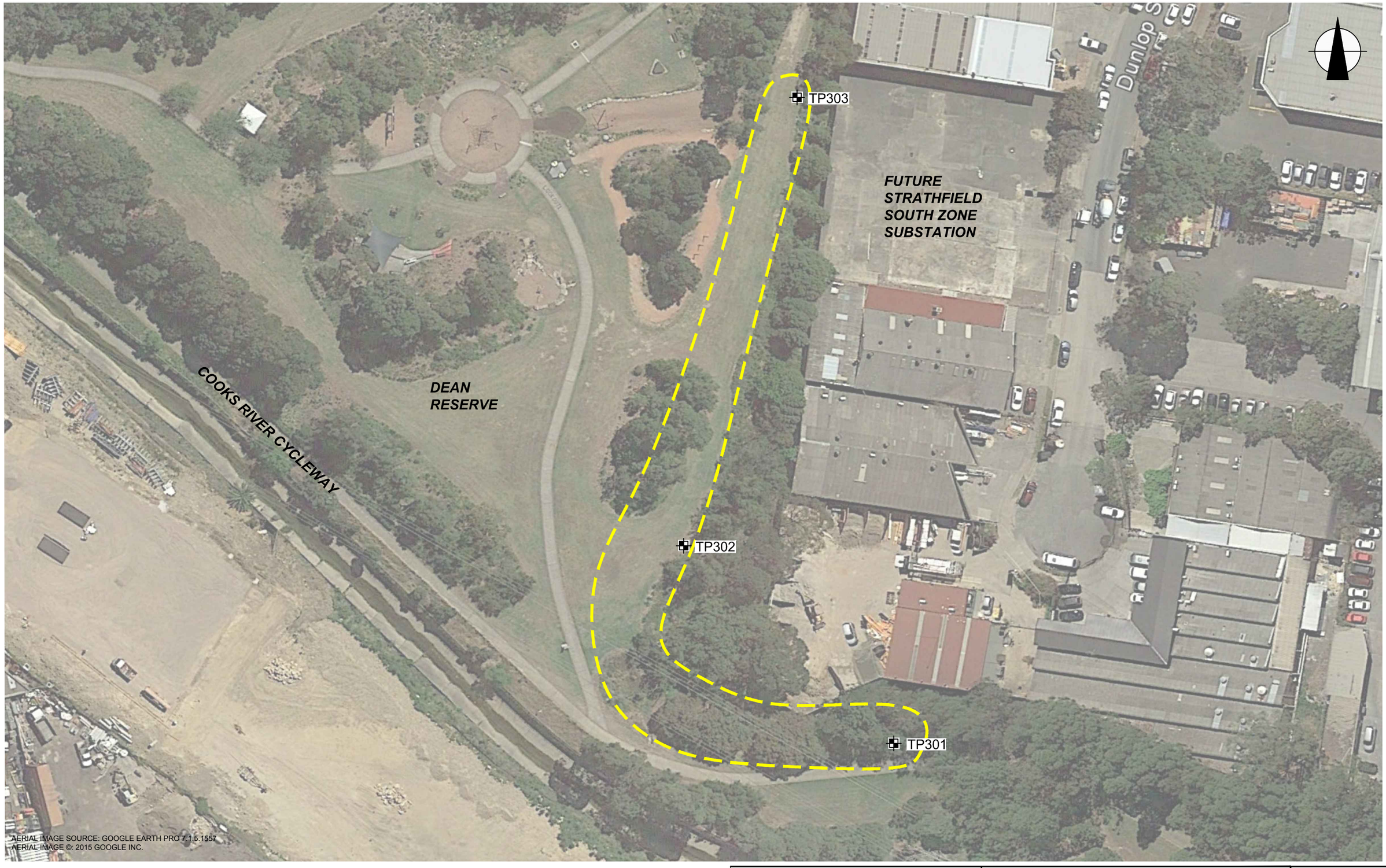
Figure No: 1

ENVIRONMENTAL INVESTIGATION SERVICES

EIS

PLOT DATE: 5/04/2018 3:46:09 PM DWG FILE: S:\5 EIS\5C EIS JOBS\29000'S\E29667K STRATHFIELD SOUTH\CAD\E29667KG.DWG

© EIS



LEGEND

APPRO□IMATE SITE BOUNDAR□

TP TEST PIT LOCATION

0 7 14 21 28 35

SCALE 1:700 @A3 METRES

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

Title: **SAMPLE LOCATION PLAN**

Project: DEAN RESERVE, DEAN STREET
STRATHFIELD SOUTH, NSW

Report No: E29667KG

Figure No: 2

ENVIRONMENTAL INVESTIGATION SERVICES

EIS

PLOT DATE: 5/04/2018 3:48:21 PM DWG FILE: S:\S EIS\S6C EIS \JOBS\29000'S\E29667K STRATHFIELD SOUTH\CAD\E29667KG.DWG

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Appendix B: Laboratory Summary Tables

Waste Classification Assessment
Dean Reserve, Strathfield South, NSW 2136
Job No: E29667KG

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	TRH					BTEX COMPOUNDS				ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P	Total Endosulfans	Chloropyrifos	Total Moderately Harmful	Total Scheduled	PCBs	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			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			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			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			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**																									
TP301	0.2-0.5	Fill- Silty Clay	11	<0.4	14	25	42	<0.1	10	56	6.32	0.62	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
TP302	0.3-0.5	Fill- Silty Clay	6	<0.4	18	28	31	<0.1	21	45	2.2	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
TP303	0.5-0.6	Fill- Silty Clay	7	0.5	15	36	86	<0.1	13	92	2	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
Total Number of samples			3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Maximum Value			11	0.5	18	36	86	<PQL	21	92	6.32	0.62	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	NC

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

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Appendix C: Test pit Logs

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

EIS

ENVIRONMENTAL LOG

Test Pit No. 301 1/1

Environmental logs are not to be used for geotechnical purposes

Client: DOWNER GROUP

Project: PROPOSED SUBSTATION DEVELOPMENT

Location: DEAN RESERVE, DEAN STREET, STRATHFIELD SOUTH, NSW

Job No. E29667KG **Method:** EXCAVATOR **R.L. Surface:** N/A

Date: 19/3/18 **Datum:**

Logged/Checked by: A.M./T.H.

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 COMPLET-ION							0			FILL: Silty clay, low to medium plasticity, orange brown, trace of root fibres, and ash.	MC<PL			GRASS COVER
	■		■				0.5			FILL: Silty sand, fine to medium grained, light brown, trace of fine to coarse grained sandstone, and shale gravel, clay, and root fibres.	D			
							1			FILL: Silty clay, low to medium plasticity, light brown mottled orange, trace of fine to coarse grained sandstone gravel, root fibres, ash and slag.	MC>PL			
							1.5			END OF TEST PIT AT 1.2m				
							2							
							2.5							
							3							
							3.5							

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ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

EIS

ENVIRONMENTAL LOG

Test Pit No. 302 1/1

Environmental logs are not to be used for geotechnical purposes

Client: DOWNER GROUP

Project: PROPOSED SUBSTATION DEVELOPMENT

Location: DEAN RESERVE, DEAN STREET, STRATHFIELD SOUTH, NSW

Job No. E29667KG **Method:** EXCAVATOR **R.L. Surface:** N/A

Date: 19/3/18 **Datum:**

Logged/Checked by: A.M./T.H.

Groundwater Record	SAMPLES (ES, ASS, ASB, SAL, DB)	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLET-ION	ES, ASB		0			FILL: Silty clay, low to medium plasticity, brown, trace of fine to coarse grained igneous gravel, brick, root fibres, and ash.	MC<PL			GRASS COVER
			0.5			FILL: Silty sand, fine to medium grained, brown, trace of fine to coarse grained igneous gravel, asphalt, brick, and ash.	D			
			1			END OF TEST PIT AT 0.9m				EXCAVATOR REFUSAL
			1.5							
			2							
			2.5							
			3							
			3.5							

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Appendix D: Laboratory Report & COC Documents

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 187710

Client Details

Client	Environmental Investigation Services
Attention	Para Bokalawela
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E29667K, Strathfield South**
Number of Samples	3 Soil
Date samples received	21/03/2018
Date completed instructions received	21/03/2018

Analysis Details

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

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

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

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

Report Details

Date results requested by	28/03/2018
Date of Issue	27/03/2018

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Asbestos Approved By
Analysed by Asbestos Approved Identifier: Jessica Hie
Authorised by Asbestos Approved Signatory: Paul Ching

Results Approved By
Dragana Tomas, Senior Chemist
Long Pham, Team Leader, Metals
Nancy Zhang, Assistant Lab Manager
Paul Ching, Senior Analyst

Authorised By

David Springer, General Manager

vTRH(C6-C10)/BTEXN in Soil				
Our Reference		187710-1	187710-2	187710-3
Your Reference	UNITS	TP301	TP302	TP303
Depth		0.2-0.5	0.3-0.5	0.5-0.6
Date Sampled		19/03/2018	19/03/2018	20/03/2018
Type of sample		Soil	Soil	Soil
Date extracted	-	22/03/2018	22/03/2018	22/03/2018
Date analysed	-	22/03/2018	22/03/2018	22/03/2018
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
naphthalene	mg/kg	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	77	78	77

svTRH (C10-C40) in Soil				
Our Reference		187710-1	187710-2	187710-3
Your Reference	UNITS	TP301	TP302	TP303
Depth		0.2-0.5	0.3-0.5	0.5-0.6
Date Sampled		19/03/2018	19/03/2018	20/03/2018
Type of sample		Soil	Soil	Soil
Date extracted	-	22/03/2018	22/03/2018	22/03/2018
Date analysed	-	23/03/2018	23/03/2018	23/03/2018
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	%	75	74	72

PAHs in Soil				
Our Reference		187710-1	187710-2	187710-3
Your Reference	UNITS	TP301	TP302	TP303
Depth		0.2-0.5	0.3-0.5	0.5-0.6
Date Sampled		19/03/2018	19/03/2018	20/03/2018
Type of sample		Soil	Soil	Soil
Date extracted	-	22/03/2018	22/03/2018	22/03/2018
Date analysed	-	22/03/2018	22/03/2018	22/03/2018
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	0.6	0.1	0.1
Anthracene	mg/kg	0.2	<0.1	<0.1
Fluoranthene	mg/kg	1	0.3	0.3
Pyrene	mg/kg	1	0.3	0.3
Benzo(a)anthracene	mg/kg	0.5	0.2	0.2
Chrysene	mg/kg	0.5	0.2	0.2
Benzo(b,j+k)fluoranthene	mg/kg	1	0.4	0.4
Benzo(a)pyrene	mg/kg	0.62	0.3	0.2
Indeno(1,2,3-c,d)pyrene	mg/kg	0.3	0.2	0.1
Dibenzo(a,h)anthracene	mg/kg	0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.4	0.2	0.2
Total +ve PAH's	mg/kg	6.3	2.2	1.8
Benzo(a)pyrene TEQ calc (zero)	mg/kg	0.9	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	0.9	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	0.9	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	118	120	115

Organochlorine Pesticides in soil				
Our Reference		187710-1	187710-2	187710-3
Your Reference	UNITS	TP301	TP302	TP303
Depth		0.2-0.5	0.3-0.5	0.5-0.6
Date Sampled		19/03/2018	19/03/2018	20/03/2018
Type of sample		Soil	Soil	Soil
Date extracted	-	22/03/2018	22/03/2018	22/03/2018
Date analysed	-	22/03/2018	22/03/2018	22/03/2018
HCB	mg/kg	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	91	94	92

Organophosphorus Pesticides				
Our Reference		187710-1	187710-2	187710-3
Your Reference	UNITS	TP301	TP302	TP303
Depth		0.2-0.5	0.3-0.5	0.5-0.6
Date Sampled		19/03/2018	19/03/2018	20/03/2018
Type of sample		Soil	Soil	Soil
Date extracted	-	22/03/2018	22/03/2018	22/03/2018
Date analysed	-	22/03/2018	22/03/2018	22/03/2018
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	91	94	92

PCBs in Soil				
Our Reference		187710-1	187710-2	187710-3
Your Reference	UNITS	TP301	TP302	TP303
Depth		0.2-0.5	0.3-0.5	0.5-0.6
Date Sampled		19/03/2018	19/03/2018	20/03/2018
Type of sample		Soil	Soil	Soil
Date extracted	-	22/03/2018	22/03/2018	22/03/2018
Date analysed	-	22/03/2018	22/03/2018	22/03/2018
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1
Surrogate TCLMX	%	91	94	92

Acid Extractable metals in soil				
Our Reference		187710-1	187710-2	187710-3
Your Reference	UNITS	TP301	TP302	TP303
Depth		0.2-0.5	0.3-0.5	0.5-0.6
Date Sampled		19/03/2018	19/03/2018	20/03/2018
Type of sample		Soil	Soil	Soil
Date prepared	-	22/03/2018	22/03/2018	22/03/2018
Date analysed	-	22/03/2018	22/03/2018	22/03/2018
Arsenic	mg/kg	11	6	7
Cadmium	mg/kg	<0.4	<0.4	0.5
Chromium	mg/kg	14	18	15
Copper	mg/kg	25	28	36
Lead	mg/kg	42	31	86
Mercury	mg/kg	<0.1	<0.1	<0.1
Nickel	mg/kg	10	21	13
Zinc	mg/kg	56	45	92

Moisture				
Our Reference		187710-1	187710-2	187710-3
Your Reference	UNITS	TP301	TP302	TP303
Depth		0.2-0.5	0.3-0.5	0.5-0.6
Date Sampled		19/03/2018	19/03/2018	20/03/2018
Type of sample		Soil	Soil	Soil
Date prepared	-	22/03/2018	22/03/2018	22/03/2018
Date analysed	-	23/03/2018	23/03/2018	23/03/2018
Moisture	%	9.2	7.7	11

Asbestos ID - soils				
Our Reference		187710-1	187710-2	187710-3
Your Reference	UNITS	TP301	TP302	TP303
Depth		0.2-0.5	0.3-0.5	0.5-0.6
Date Sampled		19/03/2018	19/03/2018	20/03/2018
Type of sample		Soil	Soil	Soil
Date analysed	-	27/03/2018	27/03/2018	27/03/2018
Sample mass tested	g	Approx. 35g	Approx. 35g	Approx. 45g
Sample Description	-	Brown coarse-grained soil & rocks	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	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	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-1	[NT]
Date extracted	-			22/03/2018	[NT]	[NT]	[NT]	[NT]	22/03/2018	[NT]
Date analysed	-			22/03/2018	[NT]	[NT]	[NT]	[NT]	22/03/2018	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	88	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	88	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	[NT]	[NT]	85	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	[NT]	[NT]	81	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	89	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	93	[NT]
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	89	[NT]
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	74	[NT]	[NT]	[NT]	[NT]	72	[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	-			22/03/2018	[NT]	[NT]	[NT]	[NT]	22/03/2018	[NT]
Date analysed	-			22/03/2018	[NT]	[NT]	[NT]	[NT]	22/03/2018	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	97	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	90	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	91	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	97	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	90	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	91	[NT]
Surrogate o-Terphenyl	%		Org-003	120	[NT]	[NT]	[NT]	[NT]	86	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			22/03/2018	[NT]	[NT]	[NT]	[NT]	22/03/2018	[NT]
Date analysed	-			22/03/2018	[NT]	[NT]	[NT]	[NT]	22/03/2018	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	91	[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]	93	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	98	[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]	92	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	98	[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]	100	[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]	101	[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	116	[NT]	[NT]	[NT]	[NT]	104	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			22/03/2018	[NT]	[NT]	[NT]	[NT]	22/03/2018	[NT]
Date analysed	-			22/03/2018	[NT]	[NT]	[NT]	[NT]	22/03/2018	[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]	95	[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]	81	[NT]
Heptachlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	76	[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]	75	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	75	[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]	80	[NT]
Dieldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	89	[NT]
Endrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	83	[NT]
pp-DDD	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	73	[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]	75	[NT]
Methoxychlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-005	102	[NT]	[NT]	[NT]	[NT]	107	[NT]

QUALITY CONTROL: Organophosphorus Pesticides					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			22/03/2018	[NT]	[NT]	[NT]	[NT]	22/03/2018	[NT]
Date analysed	-			22/03/2018	[NT]	[NT]	[NT]	[NT]	22/03/2018	[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]	86	[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]	95	[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]	81	[NT]
Fenitrothion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Malathion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Parathion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Ronnel	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Surrogate TCMX	%		Org-008	102	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			22/03/2018	[NT]	[NT]	[NT]	[NT]	22/03/2018	[NT]
Date analysed	-			22/03/2018	[NT]	[NT]	[NT]	[NT]	22/03/2018	[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]	100	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCLMX	%		Org-006	102	[NT]	[NT]	[NT]	[NT]	103	[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	-			22/03/2018	[NT]	[NT]	[NT]	[NT]	22/03/2018	[NT]
Date analysed	-			22/03/2018	[NT]	[NT]	[NT]	[NT]	22/03/2018	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	110	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	100	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	114	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	107	[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.

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 187710- 1-3 were sub-sampled from bags provided by the client.

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD	EIS Job Number: E29667K	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: 1/1	Attention: Para Bokalawela
Attention: Aileen		

Location:	Strathfield South	Sample Preserved in Esky on Ice
Sampler:	AM	Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 2	Combo 3a	Combo 6	Combo 6a	8 Metals	PAHs	TRH/BTEX	BTEX	Asbestos			
19/03/2018	1	TP301	0-2-0-5	G, A	0	F: Silty Sand				X								
↓	2	TP302	0.3-0.5	↓	0.1	↓				X								
20/3/18	3	TP303	0-5-0-6		0.1					X								

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

Job No: 187410
Date Received: 21.3.18
Time Received: 1045
Received by: PH
Temp: Cool/Ambient
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:
[signature]	21/3/18		ES	21/3

ENVIRONMENTAL INVESTIGATION SERVICES

9 May 2018
Report Ref: E31344KGlet-WC&ASS

Downer Group
Unit 2, 16 Galleghan Street
Hexham NSW 2322

Attention: Kari Torpstrom

WASTE CLASSIFICATION ASSESSMENT & PRELIMINARY ACID SULFATE SOIL ASSESSMENT
PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION DEVELOPMENT
7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW 2136

1 INTRODUCTION

Downer Group ('the client') commissioned Environmental Investigation Services (EIS)[1] to assign a waste classification for off-site disposal of soil that is to be excavated and removed from the site located at 7-9 Dunlop Street, Strathfield South during the proposed development works.

The scope of work also included a preliminary assessment of the risk of encountering actual or potential Acid Sulfate Soil (ASS) during the proposed development works and to assess whether an Acid Sulfate Soil Management Plan (ASSMP) is required.

The site location is shown on Figure 1 and sampling for the assessment was confined to the in-situ soil in the investigation area as shown on Figure 2 attached in the appendices.

The assessment was undertaken generally in accordance with an EIS proposal (Ref: EP45967KD) of 23 February 2018 and written acceptance from Downer Group by email of 5 March 2018.

A geotechnical investigation was undertaken in conjunction with the waste classification and ASS assessment by JK Geotechnics[2] and the results are presented in a separate report (Ref: 31344ZArpt, dated 7 May 2018).

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

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Tel: 02 9888 5000 ● Fax: 9888 5004
EIS is a division of Jeffery and Katauskas Pty Ltd ● ABN 17 003 550 801

2 BACKGROUND

EIS have prepared a Stage 1 & 2 Environmental Site Assessment report for the proposed development (EIS ref: E28660KBrpt, dated 8 October 2015). A preliminary waste classification was provided in conjunction with the above assessment. EIS recommended that additional waste classification and ASS testing be undertaken.

EIS have undertaken a Stage 1 & 2 Environmental Site Assessment for the site in 2015. The report (Ref: E28660KBrpt) issued on 8 October 2015 classified the material as Restricted Soil Waste containing asbestos. However no TCLP analysis was commissioned, this may have reduced the classification to General Solid Waste containing asbestos.

2.1 Assessment Guidelines

The waste classification for the off-site disposal of the material was assessed in accordance with the NSW EPA Waste Classification Guidelines - Part 1: Classifying Waste (2014)[3].

The ASS assessment and preparation of the report was undertaken with reference to the Acid Sulfate Soil Management Advisory Committee (ASSMAC) Acid Sulfate Soil Manual (1998)[4]. Background information on ASS and the assessment process is provided in the appendices.

2.2 Proposed Development Details

EIS understand that the proposed development includes the construction of a new zone substation comprising of a single storey switch and control building for 11kV and 132kV switchgear, and two transformer bays. The proposed building will be partially underlain by a cable basement. The proposed cable basement will require excavation to depths of approximately 2.5m and 3.5m below ground level (bgl). Two external transformer bund hardstand areas and on-grade driveways are also proposed towards the north-eastern corner of the site.

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

[4] Acid Sulfate Soils Management Advisory Committee (ASSMAC), (1998). *Acid Sulfate Soils Manual* (ASS Manual 1998)

3 SITE INFORMATION

3.1 Site Identification and Description

Table 3-1: Site Identification

Site Address:	7-9 Dunlop Street, Strathfield South, NSW 2136
Lot & Deposited Plan:	Lots 15 & 16 in DP29223
Current Land Use:	Commercial
Approximate Site Area (m^2):	2,075
Geographical Location (approx.):	Latitude: -33. 89527 Longitude: 151. 079641

The site is located in a predominantly residential and commercial/industrial area of Strathfield South. The site is located in gently undulating regional topography on a south east facing hillside generally sloping down at 2° and increasing to 5° within the south eastern corner of the site. A concrete lined section of the Cooks River is located approximately 100m to the south of the site.

The site was located to the east of Dean Reserve. Commercial properties were located at the adjacent north and south of the site. Commercial properties were located to the east of the site beyond Dunlop Street. At the time of the inspection the site was concrete paved with no visible aboveground infrastructure.

3.2 Background/Historical Information

EIS has undertaken a preliminary historical assessment based on a review of the following information:

- The 1943 and 2016 aerial photographs for the site provided by SIX Maps[5]; and
- The contaminated land records provided by the NSW EPA[6].

Based on interpretation of the 1943 aerial photograph the site was vacant land. A quarry was located to the west of the site where the existing Dean Reserve is located. There were no records for the site on the NSW EPA contaminated land registers.

Considering the above information, the waste classification assessment will consider a broad suite of potential contaminants as outlined in Section 5.4.

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

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

3.3 Regional Geology

Regional geological information presented in the Lotsearch report presented in the EIS 2016 report indicated that the site is underlain by Quaternary aged deposits of silty to peaty quartz sand, silt, and clay with ferruginous and humic cementation in places and common shell layers.

3.4 Acid Sulfate Soil Risk Map

A review of the ASS risk maps of Botany Bay prepared by Department of Land and Water Conservation (1997)[7] indicates that the site is located on the boundary of "no known occurrence" of acid sulfate soil and an area of low probability of acid sulfate at a depths greater than 3m below the ground surface.

4 ASSESSMENT CRITERIA

4.1 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)[8] 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 4-1: Waste Categories

Category	Description
General Solid Waste (non-putrescible)	• If Specific Contaminant Concentration (SCC) ≤ Contaminant Threshold (CT1) then Toxicity Characteristics Leaching Procedure (TCLP) not needed to classify the soil as general solid waste; • If TCLP ≤ TCLP1 and SCC ≤ SCC1 then treat as general solid waste
Restricted Solid Waste (non-putrescible)	• If SCC ≤ CT2 then TCLP not needed to classify the soil as restricted solid waste; and • If TCLP ≤ TCLP2 and SCC ≤ SCC2 then treat as restricted solid waste
Hazardous Waste	• If SCC > CT2 then TCLP not needed to classify the soil as hazardous waste; and • If TCLP > TCLP2 and/or SCC > SCC2 then treat as hazardous waste.
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

[7] Department of Land and Water Conservation, (1997). *1:25,000 Acid Sulfate Soil Risk Map (Series 9130N3, Edition 2).*

[8] Protection of Environment Operations Act 1997 (NSW) (POEO Act 1997)

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

4.2 ASS Investigation Requirements

The ASS Manual 1998 recommends a minimum of four sampling locations for a site with an area up to 1ha (10,000m^2). For sites greater than 4ha, the manual recommends the use of a reduced density of two locations per hectare subject to the proposed development.

The sampling locations should include all areas where significant disturbance of soils will occur and/or areas with a high environmental sensitivity. In some instances, a varied sampling plan may be more suitable, particularly for sites less than 1,000m^2 in area.

The depth of investigation should extend to at least 1m beyond the depth of proposed excavation/disturbance or estimated drop in water table height, or to a minimum of 2m below existing ground level, whichever is greatest.

4.3 ASS Action Criteria

The ASS Manual 1998 presents 'action criteria' for the interpretation of laboratory results. The 'action criteria' define the need to prepare an ASSMP and are based on soil pH, potential acidity and the percentage of oxidisable sulfur for broad categories of soil types. Where disturbance of greater than 1,000 tonnes of ASS is proposed, the action criteria for 'coarse textured soils' apply to all soil types.
The following action criteria are presented in the ASS Manual:

Table 4-2: ASS Action Criteria

Category	Description	Criteria
Coarse Textured Soils	Sands to loamy sands	• pH - less than 5; • Total Actual Acidity (TAA)/Total Sulfide Acidity (TSA)/ Total Potential Acidity (TPA) (pH5.5) – greater than 18mol H^+/tonne; and • S_{pos} – greater than 0.03% sulfur oxidisable.
Medium Textured Soils	Sandy loams to light clays	• pH - less than 5; • TAA/TSA/TPA (pH5.5) – greater than 36mol H^+/tonne; and • S_{pos} – greater than 0.06% sulfur oxidisable.

Category	Description	Criteria
Fine Textured Soils	Medium to heavy clays and silty clays	• pH - less than 5; • TAA/TSA/TPA (pH5.5) – greater than 62mol H^+/tonne; and • S_{pos} – greater than 0.1% sulfur oxidisable.

The action criteria for Fine Textured soils has been used for this assessment on the basis that the earthworks and piling will disturb less than 1,000 tonnes of ASS. The bulk of the excavation will be into fill-soil and the suspected ASS is located in a thin strata of organic material located in the northwest section of the site at the depth of approximately 6m below the existing ground level.

5 INVESTIGATION PROCEDURE

5.1 Subsurface Investigation and Soil Sampling

Field work for this investigation was undertaken from 19 to 22 March 2018. Soil samples for Waste Classification and ASS assessments were obtained from six boreholes drilled for the geotechnical investigation by JK Geotechnics. The sampling locations are shown on Figure 2 attached in the appendices. The geotechnical investigation was limited to a maximum depth of approximately 13m.

Based on the proposed development details provided at the time of reporting, the number of sample locations and the depth of sampling meets the minimum requirements outlined in the ASS Manual 1998.

The sample locations were drilled using a 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.

Soil samples were collected from the fill and natural profiles encountered during the investigation. 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.

5.2 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.

5.3 Sample Preservation

Soil samples for waste classification were preserved by immediate storage in an insulated sample container with ice in accordance with AS4482.1-2005 and AS4482.2-1999[9] as summarised in the following table. The soil samples for ASS assessment were preserved by immediate storage in an insulated sample container with ice and frozen upon return to the EIS office.

Table 5-1: 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.

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

5.4 Laboratory Analysis

Samples for the Waste Classification were analysed for a range of potential contaminants based on the site information presented in Section 3. 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.

Nine (9) 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);
- Polychlorinated biphenyls (PCBs);
- Asbestos; and
- TCLP leachate analysis for PAHs and heavy metals where required.

Two (2) selected in-situ natural soil samples were analysed for the following:

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

One fill and seven selected natural soil samples were analysed for ASS/PASS using the suspension Peroxide Combined Acidity and Sulfur (sPOCAS) analytical methods detailed in AS4969-2008/09[10]. Confirmation of elevated peroxide oxidisable sulfer (Spos) results was undertaken using the chromium reducible sulfer method.

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[11]). Reference should be made to the laboratory reports (Ref: 188062, 188062A and 188074) attached in the appendices for further information.

[10] Standards Australia, (2008/2009). *Analysis of acid sulfate soil – Dried samples – Methods of test, Parts 1 to 14.* (AS4969-2008/09)

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

6 RESULTS OF THE INVESTIGATION

6.1 Subsurface Conditions

The subsurface conditions encountered generally consisted of concrete pavement or asphaltic concrete pavement, underlain by fill material to a maximum depth of approximately 4.8m, underlain by silty clay. Shale bedrock was encountered underneath the clay to the termination depth of the boreholes at approximately 13m. The fill material typically consisted of brown silty clay with inclusions of gravel, ash, slag, brick fragments, glass fragments and organic matter. Reference should be made to the borehole logs attached in the appendices for further details.

6.2 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.

6.3 Laboratory Results – Waste Classification Assessment

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 6-1: 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	11	2	0	Lead concentrations exceeded the CT1 criterion in two fill samples collected from BH205 (3.4-3.5m) and BH207 (2.9-3.0m). The maximum lead concentration was 550mg/kg.
TRH	11	0	0	All results were below the CT1 criterion.
BTEX	8	0	0	All results were below the laboratory practical quantitation limits (PQLs) and CT1 criteria.
Total PAHs	11	0	0	All results were below the CT1 criterion.
Benzo(a)pyrene	11	1	0	One B(a)P result exceeded the CT1 concentration. A B(a)P concentration of 0.97 mg/kg was detected in the fill sample from BH207 (0.2-0.3m).
OCPs & OPPs	11	0	0	All results were below the laboratory PQLs and CT1 criteria.
PCBs	11	0	0	All results were below the laboratory PQLs and CT1 criteria.

Analyte	No. of Samples Analysed	No. of Results > CT Criteria	No. of Results > SCC Criteria	Comments
Asbestos	9	-	-	Asbestos was not detected in the samples analysed.

Table 6-2: Summary of Soil Laboratory Results Compared to TCLP Criteria

Analyte	No. of Samples Analysed	No. of Results > TCLP Criteria	Comments
Lead	2	0	The two fill samples with lead concentrations above the CT1 criterion were analysed for TCLP lead. Both results were below the TCLP1 criterion.
Benzo(a)pyrene	1	0	The fill sample with B(a)P concentration above the CT1 criterion was analysed for TCLP PAHs. The result was below the TCLP1 criterion.

6.4 Laboratory Results – ASS Assessment

The soil laboratory results were assessed against the action criteria adopted for the assessment. The results are presented in the attached report tables and summarised below.

Table 6-3: Summary of ASS Results

Analyte	Results Compared to ASS Guidelines
pH_{kcl} and pH_{ox}	The pH_{KCl} results ranged from 4.1 to 8.5. One sample (BH202 – 1.0-1.2m) had pH_{KCl} results exceeded (i.e. was below) the action criterion of pH 5. Following oxidation, the pH_{ox} results for the samples ranged from 3.7 to 7.7. Two samples (BH202 – 1.0-1.2m and BH203 – 6.3-6.5m) had pH_{KCl} results exceeded (i.e. were below) the action criterion of pH 5.
Acid Trail	• TAA results ranged from less than the practical quantitation limit (PQL) to 61mol H^+/tonne. All results were below the action criterion of 62mol H^+/tonne; • TPA results ranged from less than the PQL to 78mol H^+/tonne. This result was above the action criterion of 62mol H^+/tonne; and • TSA results ranged from less than PQL to 16mol H^+/tonne. All the results were below the action criterion of 62mol H^+/tonne.
Sulfur Trail	The S_{pos}% results ranged for <0.005% to 0.06%. The S_{pos}% results did not exceed the action criterion of 0.1%.
Liming Rate	The liming rate required for neutralisation ranged from 1.6 kg$CaCO_3$/tonne to 4.7 kg$CaCO_3$/tonne.

7 CONCLUSIONS

7.1 Acid Sulfate Soil

Two samples returned results that were outside the acceptance criteria. Sample BH202 (1.0-1.2) was a fill sample with pH_{kcl} and pH_{ox} values outside of the acceptance criteria. This was also reflected in the elevated TPA result. These elevations were considered to be associated with other factors affecting acidity (e.g. humic acids) rather than ASS as the concentration of peroxide oxidisable sulfer (S_{pos}) in the sample was below the action criteria.

Sample BH203 (6.3-6.5) returned a pH_{ox} value outside of the acceptance criteria. As discussed above this was considered to be associated with other factors (e.g. humic acids) rather than ASS as the S_{pos} concentration was below the action criteria. Based on these results EIS are of the opinion that the risk of encountering ASS is low and an ASS management plan is not considered necessary for this site.

7.2 Waste Classification

The previous report (Ref: E28660KBrpt dated 8 October 2015) classified the fill material as Restricted Solid Waste containing asbestos. However, no TCLP analysis was commissioned and EIS were of the opinion that TCLP analysis may have reduced the waste classification to General Solid Waste (GSW) containing asbestos.

Based on the results of this assessment (including TCLP analysis) the following waste classifications would apply:

Cable Basement Excavation – Fill material excavated for the cable basement would be classified as GSW containing asbestos. The underlying natural soil would be classified as VENM. We recommend the site is inspected by an Environmental Consultant after removal of the fill and prior to excavating the VENM.

Piling Spoil – The most economical way of dealing with the piling spoil would be to divide the site into two sections centred on BH208. To the east of BH208 the fill is shallow and could be stripped of and disposed of as GSW containing asbestos. Once the natural soil has been exposed the piles to the east of BH208 will only return VENM to the surface. As noted above we recommend that this area is inspected by an Environmental Consultant after removal of the fill. To the west of BH208 stripping the fill will not be viable due to the depth. Therefore the piling spoil to the west of BH208 will be a mixture of fill and natural soil and will be classified as GSW containing asbestos.

This procedure will require careful management of earthworks to minimise the volume of GSW containing asbestos requiring disposal. Any VENM that becomes mixed with the fill will be classified as GSW containing asbestos.

7.3 Recommendations

Any unexpected finds encountered during the site works should be inspected by a suitably qualified contaminated land consultant[12]. 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.

Due to the contaminants encountered in the fill samples, EIS are of the opinion that the potential for widespread contamination at the site is relatively high. EIS recommend undertaking an Environmental Site Assessment (ESA) to meet the relevant NSW EPA guidelines to characterise the contamination risk to receptors.

Should significant quantities of fill material require disposal, EIS consider that further assessment will be required to adequately assess and classify the fill material at the site.

Following removal of the fill material additional tests should be undertaken on the natural soil underlying the order to classify the material as VENM.

7.4 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.

[12] EIS recommend that the consultancy engaged for the work be a member of the Australian Contaminated Land Consultants Associated (ACLCA), and/or the individual undertaking the works be certified under one of the NSW EPA endorsed certified practitioner schemes

8 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,

Para Bokalawela
Senior Environmental Engineer

Adrian Kingswell
Principal

Appendices:

Appendix A: Report Figures
Appendix B: Laboratory Summary Tables
Appendix C: Borehole Logs
Appendix D: Laboratory Reports & 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: 7-9 DUNLOP STREET
STRATHFIELD SOUTH, NSW

Report No: E31344KG

Figure No: 1

ENVIRONMENTAL INVESTIGATION SERVICES

EIS

PLOT DATE: 9/05/2018 5:43:04 PM DWG FILE: S:\5 EIS\5C EIS JOBS\31000'S\E31344KG STRATHFIELD SOUTH\CAD\E31344KG.DWG

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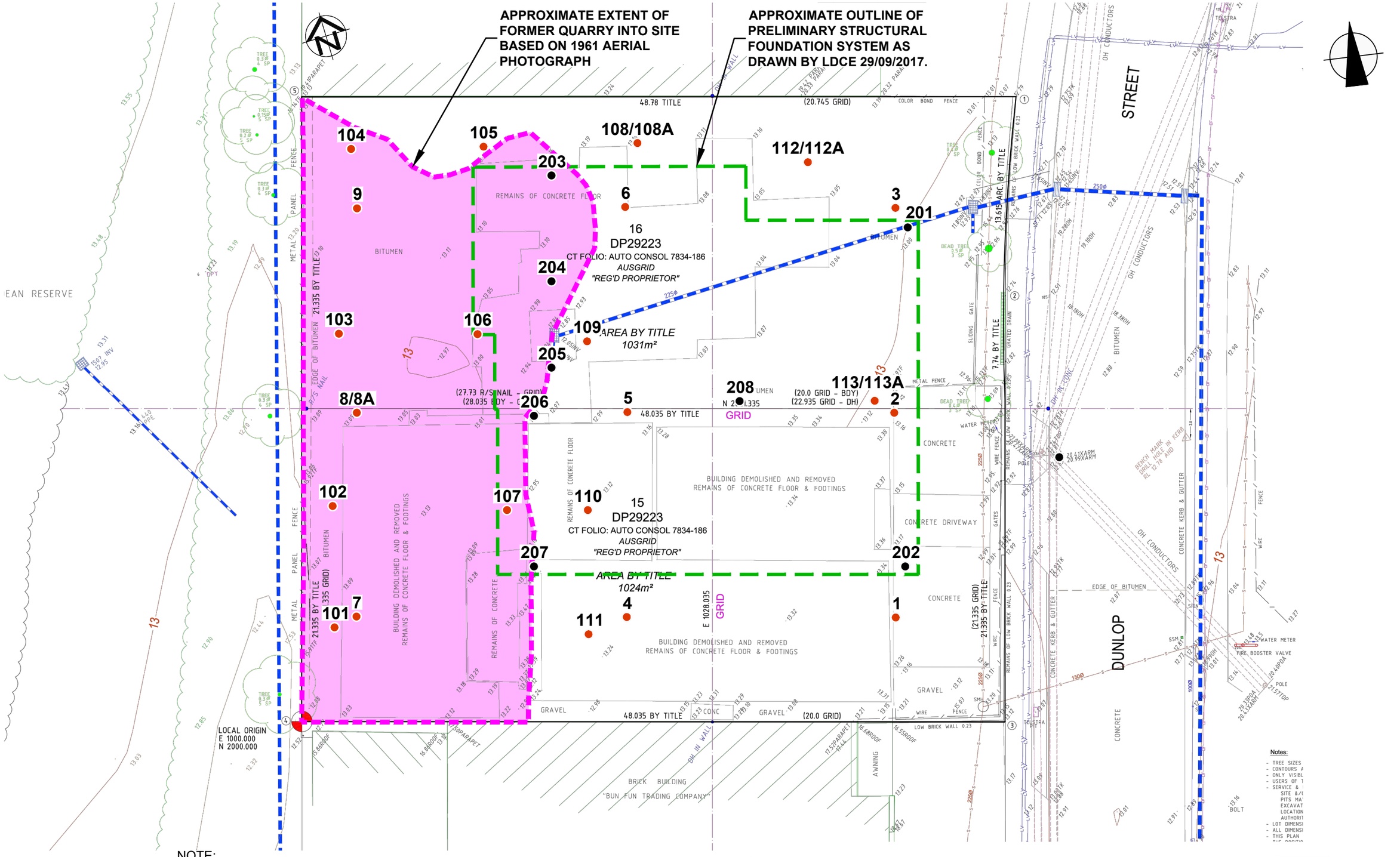

NOTE:

1. BOREHOLES 1 TO 9 ARE FROM OUR PREVIOUS GEOTECHNICAL INVESTIGATION REPORT, REF. 28660ZArpt, DATED 9 OCTOBER 2015.
2. BOREHOLES 101 TO 113/113A ARE FROM OUR PREVIOUS GEOTECHNICAL INVESTIGATION, REPORT, REF. 28660ZA2RPT, DATED 15 MARCH 2016.
3. BOREHOLES 201 TO 208 ARE FROM THE CURRENT INVESTIGATION.

0 2.5 5 7.5 10 12.5
SCALE 1:250 @A3 METRES

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

Title: **BOREHOLE LOCATION PLAN**

Location: 7-9 DUNLOP STREET
STRATHFIELD SOUTH, NSW

Report No: E31344KG

Figure No: 2

ENVIRONMENTAL INVESTIGATION SERVICES

EIS

PLOT DATE: 9/05/2018 5:43:34 PM DWG FILE: S:\5 EIS\6C EIS JOBS\31000'S\E31344KG STRATHFIELD SOUTH\CADE31344KG.DWG

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Appendix B: Laboratory Summary Tables

Waste Classification and ASS Assessment
7-9 Dunlop Street, Strathfield South, NSW 2136
Job No: E31344KGlet

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	TRH					BTEX COMPOUNDS				ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P	Total Endosulfans	Chloropyrifos	Total Moderately Harmful	Total Scheduled	PCBs	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			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			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			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			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**																									
BH201	0.2-0.3	Fill-Silty sandy gravel	6	<0.4	12	42	48	<0.1	11	65	0	<0.05	<PQL	NA	<PQL	<PQL	<PQL	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
BH201	0.8-1.0	Silty CLAY	<4	<0.4	8	3	8	<0.1	2	5	0	<0.05	<PQL	NA	<PQL	<PQL	<PQL	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	NA
BH202	0.2-0.3	Fill-Gravelly clay	5	<0.4	12	12	17	<0.1	8	46	0	<0.05	<PQL	NA	<PQL	<PQL	<PQL	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
BH202	1.0-1.2	Silty CLAY	<4	<0.4	20	4	9	<0.1	2	5	0	<0.05	<PQL	NA	<PQL	<PQL	<PQL	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	NA
BH203	0.2-0.3	Fill-Silty clay	5	<0.4	13	37	66	<0.1	23	60	0.35	0.05	<PQL	NA	<PQL	<PQL	<PQL	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
BH205	0.1-0.2	Fill-Silty gravelly clay	8	<0.4	20	22	58	<0.1	9	70	0.9	0.1	<PQL	NA	<PQL	<PQL	<PQL	<25	<50	100	180	280	<0.2	<0.5	<1	<3	Not Detected
BH205	1.0-1.1	Fill-Silty clay	6	<0.4	15	14	31	<0.1	6	28	0.39	0.09	<PQL	NA	<PQL	<PQL	<PQL	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
BH205	3.4-3.5	Fill-Silty clay	12	0.6	20	64	**110**	<0.1	13	170	0.2	<0.05	<PQL	NA	<PQL	<PQL	<PQL	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
BH207	0.2-0.3	Fill-Sand	<4	<0.4	6	42	12	<0.1	4	51	11	**0.97**	<PQL	NA	<PQL	<PQL	<PQL	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
BH207	2.9-3.0	Fill-Clayey silt	9	6.1	29	450	**550**	0.2	35	790	0	<0.05	<PQL	NA	<PQL	<PQL	<PQL	<25	<50	100	150	250	<0.2	<0.5	<1	<3	Not Detected
BH208	0.2-0.3	Fill-Silty clay	6	<0.4	10	11	30	<0.1	5	30	0	<0.05	<PQL	NA	<PQL	<PQL	<PQL	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
Total Number of samples			11	11	11	11	11	11	11	11	11	11	11	0	11	11	11	11	11	11	11	11	11	11	11	11	9
Maximum Value			12	6.1	29	450	550	0.2	35	790	11	0.97	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	100	180	280	<PQL	<PQL	<PQL	<PQL	NC

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

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TABLE B
SOIL LABORATORY TCLP RESULTS
All data in mg/L unless stated otherwise

			Arsenic	Cadmium	Chromium	Lead	Mercury	Nickel	B(a)P
PQL - Envirolab Services			0.05	0.01	0.01	0.03	0.0005	0.02	0.001
TCLP1 - General Solid Waste			5	1	5	5	0.2	2	0.04
TCLP2 - Restricted Solid Waste			20	4	20	20	0.8	8	0.16
TCLP3 - Hazardous Waste			>20	>4	>20	>20	>0.8	>8	>0.16
Sample Reference	**Sample Depth**	**Sample Description**							
BH205	3.4-3.5	Fill-Silty clay	NA	NA	NA	0.1	NA	NA	NA
BH207	0.2-0.3	Fill-Sand	NA	NA	NA	NA	NA	NA	<0.001
BH207	2.9-3.0	Fill-Clayey silt	NA	NA	NA	0.2	NA	NA	NA
Total Number of samples			0	0	0	2	0	0	1
Maximum Value			<PQL	<PQL	<PQL	0.2	<PQL	<PQL	<PQL

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

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TABLE C

SUMMARY OF LABORATORY RESULTS - ACID SULFATE SOIL ANALYSIS (sPOCAS)

		Analysis	pH_{KCL}	TAA	pH_{ox}	TPA	TSA	S_{POS}	S_{Cr}	Liming Rate
				pH 6.5		pH 6.5	pH 6.5	%w/w	%w/w	kg $CaCO_3$/tonne
Acid Sulfate Soil Manual (1998) -Action Criteria		Fine Textured Soil	pH 5.0	62molH+/ tonne	pH 5.0	62molH+/ tonne	62molH+/ tonne	0.1% w/w	0.1% w/w	
Sample Reference	**Sample Depth (m)**	**Sample Description**								
BH202	1.0-1.2	Silty Clay	4.1	61	4.3	78	16	<0.005	NA	4.7
BH202	5.8-6.0	Silt	5.6	<5	6.4	<5	<5	<0.005	NA	<0.75
BH203	0.5-0.95	Fill-Silty Clay	7.8	<5	7.5	<5	<5	0.02	NA	<0.75
BH203	1.8-1.95	Silty Clay	5.2	<5	6.4	<5	<5	<0.005	NA	<0.75
BH203	6.3-6.5	Organic Silty Clay	6.5	<5	3.7	15	15	0.06	0.006	1.6
BH203	7.5-7.85	Silty Clay	7.4	<5	7.2	<5	<5	0.02	NA	<0.75
BH205	4.4-4.5	Fill-Silty Clay	8.5	<5	7.7	<5	<5	0.06	0.05	<0.75
BH207	4.3-4.4	Silty Clay	7.6	<5	7.7	<5	<5	0.006	NA	<0.75
Total Number of Samples			8	8	8	8	8	8	2	8
Minimum Value			4.1	61	3.7	15	15	0.006	0.006	1.6
Maximum Value			8.5	61	7.7	78	16	0.06	0.05	4.7

Values Exceeding Action Criteria — **VALUE**

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Appendix C: Borehole Logs

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Borehole No. 201
1 / 3

BOREHOLE LOG

Client: DOWNER

Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION

Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~13.0 m

Date: 21/3/18 **Datum:** AHD

Plant Type: HYDROPOWER **Logged/Checked By:** T.P./A.J.

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
									-	ASPHALTIC CONCRETE: 40mm.t FILL: Silty sandy gravel, fine to coarse grained, igneous, grey, fine to medium grained sand, trace of glass fragments and sandstone cobbles.	M			NO SPT AT 0.5m DUE TO OBSTRUCTIONS IN FILL
									CI	Silty CLAY: medium plasticity, grey mottled orange brown.	w>PL	VSt		CH4 0% LEL ALLUVIAL
ON COMPLETION OF CORING					N = 18 5,8,10	12	1						380 390 370	
						11	2		CL-CI	Silty CLAY: low to medium plasticity, grey mottled orange brown, trace of fine to medium grained ironstone gravel.		S - F		
ON COMPLETION OF AUGERING					N=0 0,0,0	10	3						90 70 80	SPT SUNK UNDER SELF-WEIGHT
						9	4					St - VSt		
					N = 9 2,3,6	8	5						230 150 180	
									CL	Silty CLAY: low plasticity, orange brown mottled grey, with clayey silty bands.		St		
					N = 7 1,3,4	7	6						150 180 160	

JK 9.01.0 LIB:GLB Log JK AUGERHOLE - MASTER 31344ZA STRATHFIELDSOUTH.GPJ <<DrawingFile>> 07/05/2018 16:52 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: JK 9.01.0 2018-03-20 Prj: JK 9.01.0 2018-03-20

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Borehole No. 201
2 / 3

BOREHOLE LOG

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~13.0 m
Date: 21/3/18 **Datum:** AHD
Plant Type: HYDROPOWER **Logged/Checked By:** T.P./A.J.

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
									CL	Silty CLAY: low plasticity, orange brown mottled grey, with clayey silty bands. *(continued)*	w>PL	VSt		
				■	N = 18 5,8,10								280 270 310	
						5	8							
									-	SHALE: brown and grey.	XW	Hd		EXTREMELY WEATHERED ROCK
				■	N > 25 15,25/ 80mm REFUSAL	4	9							
										REFER TO CORED BOREHOLE LOG				
						3	10							
						2	11							
						1	12							
						0	13							

JK 9.01.0 LIB.GLB Log JK AUGERHOLE - MASTER 31344ZA STRATHFIELDSOUTH.GPJ <<DrawingFile>> 07/05/2018 16:52 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: JK 9.01.0 2018-03-20 Prj: JK 9.01.0 2018-03-20

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Borehole No. 201
3 / 3

CORED BOREHOLE LOG

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA | **Core Size:** NMLC | **R.L. Surface:** ~13.0 m
Date: 21/3/18 | **Inclination:** VERTICAL | **Datum:** AHD
Plant Type: HYDROPOWER | **Bearing:** N/A | **Logged/Checked By:** T.P./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	DEFECT DETAILS: SPACING (mm) (600, 200, 60, 20)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
					START CORING AT 9.48m						
100% RETURN		3	10		SHALE: dark grey and orange brown.	XW	Hd				Ashfield Shale
					SHALE: grey, with dark grey laminae, bedded at 0-5°	FR	M - H				
							M			(10.04-10.61m) XWS, 0 - 3°, 5-10mm.t, TYPICALLY SPACED 15mm TO 60mm	
		2	11							(10.77m) XWS, 0 - 3°, 13 mm.t (10.93m) XWS, 0 - 3°, 4 mm.t (10.96m) XWS, 0 - 3°, 8 mm.t	
										(11.34m) XWS, 0 - 3°, 8 mm.t (11.58m) XWS, 0 - 3°, 8 mm.t	
		1	12							(11.93m) J, 72°, P, R, Cn (12.02m) J, 85°, P, R, Cn (12.09m) XWS, 0 - 3°, 25 mm.t (12.27m) XWS, 0 - 3°, 15 mm.t (12.34m) XWS, 0 - 3°, 3 mm.t (12.52m) XWS, 0 - 3°, 3 mm.t (12.54m) Cr, 0 - 3°, 5 mm.t (12.80m) XWS, 0 - 3°, 5 mm.t (12.83m) Jh, 50°, Un	
		0	13		END OF BOREHOLE AT 13.00 m						
		-1	14								
		-2	15								

JK 9.01.0 LIB.GLB Log JK CORED BOREHOLE - MASTER 31344ZA STRATHFIELDSOUTH.GPJ <<DrawingFile>> 07/05/2018 16:53 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: JK 9.01.0 2018-03-20 Prj: JK 9.01.0 2018-03-20

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FRACTURES NOT MARKED ARE CONSIDERED TO BE DRILLING AND HANDLING BREAKS

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BOREHOLE LOG

Borehole No. 202

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~13.2 m
Date: 22/3/18 **Datum:** AHD
Plant Type: HYDROPOWER **Logged/Checked By:** T.P./A.J.

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
										CONCRETE: 140mm.t				8mm DIA. REINFORCEMENT 105mm TOP COVER
						13			-	FILL: Gravelly clay, low plasticity, red brown, fine to coarse grained sandstone gravel.	M			CH4 0% LEL
					N = 10 2,4,6				CI-CH	Silty CLAY: medium to high plasticity, brown mottled red brown.	w>PL	VSt	250 310 280	ALLUVIAL
						12	1		CI	Silty CLAY: medium plasticity, light grey mottled orange brown.		Hd		
					N = 20 6,9,11								>600 >600 >600	
						11	2		ML	SILT: low plasticity, light grey mottled orange brown.	w~PL	St		
					N = 10 4,5,5	10	3						120 120 110	
ON COMPLETION OF CORING							4		CL	Silty CLAY: low plasticity, light grey mottled orange brown.		VSt		
					N = 20 5,10,10	9								
						8	5							
									ML	SILT: low plasticity, light grey mottled orange, with medium plasticity clay bands.				
ON COMPLETION OF AUGERING					N = 10 5,7,3	7	6						320 360 310	

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Borehole No. 202
2 / 3

BOREHOLE LOG

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~13.2 m
Date: 22/3/18 **Datum:** AHD
Plant Type: HYDROPOWER **Logged/Checked By:** T.P./A.J.

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
						6			CI	Silty CLAY: medium plasticity, orange brown mottled light grey, trace of fine to coarse grained ironstone gravel.	w>PL	Hd		
					N = 34 6,11,23								420 410 >600	
						8			-	SHALE: grey and orange brown.	XW	Hd		VERY LOW 'TC' BIT RESISTANCE
						5				REFER TO CORED BOREHOLE LOG				EXTREMELY WEATHERED ROCK
						4	9							
						3	10							
						2	11							
						1	12							
						0	13							

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Borehole No. 202 3 / 3

CORED BOREHOLE LOG

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Core Size:** NMLC **R.L. Surface:** ~13.2 m
Date: 22/3/18 **Inclination:** VERTICAL **Datum:** AHD
Plant Type: HYDROPOWER **Bearing:** N/A **Logged/Checked By:** T.P./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	DEFECT DETAILS: SPACING (mm) (600, 200, 60, 20)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
					START CORING AT 8.14m						
100% RETURN		5	9		SHALE: grey and orange brown, with very low strength bands.	XW	Hd				
		4									
			10		SHALE: grey, with dark grey laminae, bedded at 0-5°.	SW	M			(9.73m) CS, 0°, 10 mm.t (9.84m) CS, 0°, 10 mm.t	Ashfield Shale
		3								(10.01m) CS, 0°, 25 mm.t	
			11							(10.15m) XWS, 0 - 3°, 2 mm.t (10.20m) XWS, 0 - 3°, 4 mm.t	
		2				FR				(10.42m) XWS, 0 - 3°, 10 mm.t	
			12							(10.58m) CS, 0 - 3°, 15 mm.t	
		1								(11.72m) J, 70°, P, S, Cn (11.81m) J, 65°, P, R, Cn	
			13				H			(12.14m) XWS, 0 - 3°, 12 mm.t	
		0			END OF BOREHOLE AT 13.10 m					(12.82m) XWS, 0 - 3°, 25 mm.t	
			14								
		-1									

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Borehole No. 203
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BOREHOLE LOG

Client: DOWNER

Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION

Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~13.2 m

Date: 19/3/18 **Datum:** AHD

Plant Type: HYDROPOWER **Logged/Checked By:** T.P./A.J.

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
										CONCRETE: 130mm.t				8mm DIA. REINFORCEMENT 90mm TOP COVER
						13			-	FILL: Silty clay, medium plasticity, grey and brown, trace of fine grained sand, fine grained shale gravel, fine to medium grained sandstone gravel, and brick fragments.	w>PL			CH4 0% LEL
					N = 6 3,3,3								280 200	HYDROCARBON ODOUR
						12	1							APPEARS MODERATELY COMPACTED
					N = 4 0,1,3	11	2		CL-CI	Silty CLAY: low to medium plasticity, light grey mottled orange brown, trace of fine to medium grained ironstone gravel, and fine grained sand.	w>PL	S - F	50 70	CH4 0% LEL ALLUVIAL
												St	170 180	
												VSt		
					N = 8 2,4,4	10	3						250 220 300	CH4 0% LEL
▽ ON COMPLETION OF CORING							4		CI	Silty CLAY: medium plasticity, grey mottled orange brown, with stiff bands.		F		
					N = 3 2,1,2	9							50 70 60	
						8	5							
							6						70 60 70	
▽ ON COMPLETION OF AUGERING					N = 1 2,1,0	7			OH	Organic silty CLAY: medium plasticity, dark grey.		S	<25 30 50	

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Borehole No. 203
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BOREHOLE LOG

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~13.2 m
Date: 19/3/18 **Datum:** AHD
Plant Type: HYDROPOWER **Logged/Checked By:** T.P./A.J.

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
						6			OH	Organic silty CLAY: as above	w>PL	S		
									CI	Silty CLAY: medium plasticity, light grey mottled orange brown.		St		
	■			■	N = 11 1,3,8								120 170	
							8					VSt	300 390	
						5			-	SHALE: dark grey, with iron indurated bands.	XW	Hd		VERY LOW 'TC' BIT RESISTANCE EXTREMELY WEATHERED ROCK
				■		4	9				DW - SW	L - M		LOW TO MODERATE RESISTANCE ASHFIELD SHALE
										REFER TO CORED BOREHOLE LOG				
						3	10							
						2	11							
						1	12							
						0	13							

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Borehole No. 203 3 / 3

CORED BOREHOLE LOG

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Core Size:** NMLC **R.L. Surface:** ~13.2 m
Date: 19/3/18 **Inclination:** VERTICAL **Datum:** AHD
Plant Type: HYDROPOWER **Bearing:** N/A **Logged/Checked By:** T.P./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	DEFECT DETAILS: SPACING (mm) (600, 200, 60, 20)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
		4			START CORING AT 9.35m						
100% RETURN		3	10		SHALE: grey, with dark grey laminae and iron indurated bands, bedded at 0-5°.	DW - SW	L - M			(9.46m) J, 70 - 90°, Un, R, Fe Sn (9.52m) XWS, 0 - 5°, 6 mm.t (9.65m) J, 75 - 90°, Un, R, Fe Sn (9.81m) XWS, 0 - 5°, 7 mm.t (9.83m) XWS, 0 - 5°, 5 mm.t (9.89m) XWS, 0 - 5°, 10 mm.t (9.91m) CS, 0 - 5°, 20 mm.t	
		2	11		as above, but without iron indurated bands.	FR	M				Ashfield Shale
		1	12							(11.87m) Jh, 68°, Un (12.62m) Jh, 70°, Un (12.69m) Jh, 65°, Un	
		0	13		END OF BOREHOLE AT 13.00 m						
		-1	14								
		-2	15								

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Borehole No. 204
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BOREHOLE LOG

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~13.1 m
Date: 19/3/18 **Datum:** AHD
Plant Type: HYDROPOWER **Logged/Checked By:** T.P./A.J.

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
						13				CONCRETE: 120mm.t				NO REINFORCEMENT OBSERVED
									-	FILL: Silty clay, low plasticity, brown, orange brown and grey, trace of fine to medium grained ironstone gravel, ash and slag.	w>PL			HYDROCARBON ODOUR
					N = 9 3,4,5									CH4 0% LEL
						12	1							APPEARS MODERATELY COMPACTED
										FILL: Clayey sand, fine to medium grained, dark brown, trace of brick fragments.	M			APPEARS POORLY COMPACTED
					N = 5 3,2,3									CH4 0% LEL
						11	2							
										FILL: Silty clay, low to medium plasticity, trace of fine grained sand, fine to medium grained shale gravel, and brick fragments.	w>PL			HYDROCARBON ODOUR
					N = 5 1,2,3	10	3							CH4 0% LEL
ON COMPLETION OF AUGERING										FILL: Brick fragments in a clay matrix, red brown.	M			
						9	4							
					N=0 2,0,0									CH4 0% LEL
									CI	Silty CLAY: medium plasticity, grey mottled orange brown.	w>PL	F - St	140 140 110	ALLUVIAL
ON COMPLETION OF CORING						8	5							
										as above, but brown mottled grey.		F		
					N = 4 1,1,3	7	6						70 60 60	
										SILTY CLAY: as below.		VSt		

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Borehole No. 204
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BOREHOLE LOG

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~13.1 m
Date: 19/3/18 **Datum:** AHD
Plant Type: HYDROPOWER **Logged/Checked By:** T.P./A.J.

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
						6			CI	Silty CLAY: medium plasticity, light grey mottled orange brown, trace of fine to coarse grained ironstone gravel. *(continued)*	w>PL	VSt		
				■	N = 30 5,10,20	5	8						250 350 320	
100% RETURN						4	9			REFER TO CORED BOREHOLE LOG				
						3	10							
						2	11							
						1	12							
						0	13							

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Borehole No. 204 3 / 3

CORED BOREHOLE LOG

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Core Size:** NMLC **R.L. Surface:** ~13.1 m
Date: 19/3/18 **Inclination:** VERTICAL **Datum:** AHD
Plant Type: HYDROPOWER **Bearing:** N/A **Logged/Checked By:** T.P./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	DEFECT DETAILS: SPACING (mm) (600, 200, 60, 20)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
		5			START CORING AT 8.21m						
		4	9		SHALE: brown and grey, with very low to low strength bands.	XW	Hd			(8.40m) J, 75 - 90°, Un, R, Fe Sn	
					SHALE: grey, with dark grey laminae and iron indurated bands, bedded at 0-5°.	DW	M			(9.37m) J, 80 - 90°, Un, R, Cn (9.38m) CS, 0 - 5°, 35 mm.t	
		3	10		as above, but without iron indurated bands.	FR				(9.85m) XWS, 5°, 4 mm.t (10.03m) Jh, 60-90°, Un (10.08m) XWS, 3°, 8 mm.t (10.22m) XWS, 0°, 9 mm.t	Ashfield Shale
		2	11							(10.72m) XWS, 0°, 4 mm.t (10.78m) XWS, 2°, 6 mm.t	
		1	12				H			(11.69m) J, 50°, Un, R, Cn (11.71m) J, 50°, Un, R, Cn (11.93m) J, 45°, P, S, Cn (12.17m) J, 45°, Un, R, Cn	
		0	13		END OF BOREHOLE AT 12.84 m						
		-1	14								

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Borehole No. 205
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BOREHOLE LOG

Client: DOWNER

Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION

Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~12.9 m

Date: 20/3/18 **Datum:** AHD

Plant Type: HYDROPOWER **Logged/Checked By:** A.C.K./A.J.

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
										CONCRETE: 90mm.t				4mm DIA. REINFORCEMENT 42mm TOP COVER
									-	FILL: Silty gravelly clay, medium plasticity, grey brown mottled orange brown and red brown, fine to medium grained igneous gravel, with fine to medium grained sand.	w>PL			
					N = 4 2,1,3	12	1			FILL: Silty clay, medium to high plasticity, dark grey brown mottled light grey, grey and light brown, trace of glass and brick fragments.			80 230 145	CH4 0% LEL
					N = 1 1,1,0	11	2						70	CH4 0% LEL APPEARS POORLY COMPACTED
ON COMPLETION OF AUGERING					N = 3 6,1,2	10	3							CH4 0% LEL
										FILL: Silty clay, low plasticity, dark grey brown, trace of glass fragments.				
						9	4							CH4 0% LEL
									ML	Clayey SILT: low plasticity, light grey and light brown, with fine grained sand.	w>PL	St - VSt		SPT OMITTED DUE TO BOREHOLE COLLAPSE
						8	5							ALLUVIAL
									CH	Silty CLAY: high plasticity, light grey and light brown, trace of fine to medium grained ironstone gravel.				
					N = 17 6,8,9	7	6						210 110 180	
						6								

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BOREHOLE LOG

Borehole No. 205

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~12.9 m
Date: 20/3/18 **Datum:** AHD
Plant Type: HYDROPOWER **Logged/Checked By:** A.C.K./A.J.

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
	■			■					CH	Silty CLAY: high plasticity, light grey and light brown, with fine grained sand.	w>PL	VSt		
				■	N > 18 8,18/ 150mm REFUSAL								350 300 360	
						5	8			REFER TO CORED BOREHOLE LOG				
						4	9							
						3	10							
						2	11							
						1	12							
						0	13							
						-1								

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Borehole No.
205
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CORED BOREHOLE LOG

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Core Size:** NMLC **R.L. Surface:** ~12.9 m
Date: 20/3/18 **Inclination:** VERTICAL **Datum:** AHD
Plant Type: HYDROPOWER **Bearing:** N/A **Logged/Checked By:** A.C.K./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$	DEFECT DETAILS: SPACING (mm)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
					START CORING AT 7.82m						
100% RETURN		5	8		SHALE: dark grey, with brown and orange brown laminae, bedded at 0-5°.	XW - DW	Hd - VL				
						DW	L				
						XW - DW	Hd - VL				
		4	9			DW	L - M			(8.97m) XWS, 0°, 140 mm.t (9.09m) XWS, 0°, 18 mm.t (9.19m) CS, 0°, 30 mm.t	
					SHALE: dark grey, with light grey laminae, bedded at 0-5°.	FR	M			(9.46m) XWS, 0°, 4 mm.t (9.54m) XWS, 0°, 3 mm.t (9.60m) XWS, 0°, 2 mm.t (9.66m) XWS, 0°, 1 mm.t (9.76m) XWS, 0°, 3 mm.t	Ashfield Shale
		3	10							(9.91m) XWS, 0°, 14 mm.t	
		2	11				M - H			(10.42m) XWS, 0°, 14 mm.t	
					END OF BOREHOLE AT 11.27 m						
		1	12								
		0	13								
		-1									

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BOREHOLE LOG

Borehole No. 206

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~13.0 m
Date: 20/3/18 **Datum:** AHD
Plant Type: HYDROPOWER **Logged/Checked By:** A.C.K./A.J.

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
										CONCRETE: 130mm.t				6mm DIA. REINFORCEMENT 88mm TOP COVER
				■					-	FILL: Gravel, fine to medium grained, igneous, dark grey brown, with clay fines and silt fines.	M			
				■	N = 1 1,1,0					FILL: Silty clay, low to medium plasticity, grey, light grey and orange brown, trace of concrete fragments.	w>PL		45 45 50	CH4 0% LEL STRONG UNIDENTIFIABLE ODOUR
						12	1							
				■	N = 5 3,4,1					FILL: Silty gravelly clay, low plasticity, dark grey, fine to medium grained igneous gravel, with organic matter and slag fragments.			45	CH4 0% LEL APPEARS POORLY COMPACTED
						11	2							
										FILL: Slag fragments, dark grey.	M			
				■	N = 3 4,2,1	10	3							CH4 0% LEL
										FILL: Silty gravelly clay, low plasticity, dark grey, fine to medium grained igneous, with organic matter.	w>PL			
						9	4							
▶				■	N = 10 3,5,5				ML	Clayey SILT: low plasticity, light grey and light brown, with fine grained sand.	w>PL	F - St	70 85	CH4 0% LEL
												VSt - Hd	190 600 380	ALLUVIAL
						8	5							
									CH	Silty CLAY: high plasticity, light grey and light brown, trace of fine to medium grained ironstone gravel.		St - VSt		
				■	N = 19 3,8,11	7	6						260 305 190 175	

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Borehole No. 206
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BOREHOLE LOG

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~13.0 m
Date: 20/3/18 **Datum:** AHD
Plant Type: HYDROPOWER **Logged/Checked By:** A.C.K./A.J.

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
									CH	Silty CLAY: high plasticity, light grey and light brown, trace of fine to medium grained ironstone gravel. *(continued)*	w>PL	Hd		
				■	N > 42 8,17,25/ 110mm REFUSAL					Silty CLAY: high plasticity, light grey, with fine grained sand.			>600 580 480	
						5	8			REFER TO CORED BOREHOLE LOG				
						4	9							
						3	10							
						2	11							
						1	12							
						0	13							

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Borehole No. 206 3 / 3

CORED BOREHOLE LOG

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Core Size:** NMLC **R.L. Surface:** ~13.0 m
Date: 20/3/18 **Inclination:** VERTICAL **Datum:** AHD
Plant Type: HYDROPOWER **Bearing:** N/A **Logged/Checked By:** A.C.K./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$: VL -0.1, L -0.3, M -1, H -3, VH -10, EH	DEFECT DETAILS: SPACING (mm) 600 200 60 20	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
					START CORING AT 7.95m						
		5	8		NO CORE 0.61m						
		4	9		SHALE: dark grey, with brown laminae, bedded at 0-5°.	XW	Hd				
100% RETURN		3	10		SHALE: dark grey, with light grey laminae, bedded at 0-5°.	SW / FR	M			(9.25m) XWS, 0°, 8 mm.t (9.38m) CS, 0°, 10 mm.t (9.58m) XWS, 0°, 5 mm.t (9.69m) CS, 0°, 2 mm.t (9.76m) CS, 0°, 2 mm.t (10.02m) XWS, 0°, 7 mm.t (10.14m) XWS, 0°, 2 mm.t (10.45m) Cr, 0°, 60 mm.t	Ashfield Shale
		2	11								
		1	12								
		0	13		END OF BOREHOLE AT 12.56 m						

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 207
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BOREHOLE LOG

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~13.3 m
Date: 22/3/18 **Datum:** AHD
Plant Type: HYDROPOWER **Logged/Checked By:** T.P./A.J.

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
										CONCRETE: 150mm.t				7mm DIA. REINFORCEMENT 55mm & 110mm TOP COVER
						13			-	FILL: Sand, fine to coarse grained, orange brown, trace of fine to coarse grained sandstone gravel.	M			CH4 0% LEL
					N = 8 2,4,4					FILL: Sandy gravel, fine to coarse grained, sandstone, red brown and light grey, fine to course grained sand.	w<PL			
						12	1			FILL: Clayey silt, low plasticity, dark brown, trace of fine to coarse grained sandstone gravel, glass fragments and organic matter.				APPEARS POORLY COMPACTED
					N = 3 1,1,2						w>PL			CH4 0% LEL
ON COMPLETION OF AUGERING & CORING						11	2							
					N = 3 1,1,2	10	3							CH4 0% LEL
							4							
						9			CI-CH	Silty CLAY: medium to high plasticity, grey mottled orange brown, with fine to coarse grained ironstone gravel.	w>PL	VSt		ALLUVIAL
					N = 25 5,12,13		5						240 240 260	CH4 0% LEL
						8						St		
					N = 6 2,2,4	7	6						110 110 110	

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BOREHOLE LOG

Borehole No. 207

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~13.3 m
Date: 22/3/18 **Datum:** AHD
Plant Type: HYDROPOWER **Logged/Checked By:** T.P./A.J.

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
				■	N = 20 4,7,13	6			CI-CH	Silty CLAY: medium to high plasticity, grey mottled orange brown, with fine to coarse grained ironstone gravel. *(continued)*	w>PL	VSt		
						5	8		-	SHALE: grey and orange brown.	XW	Hd		EXTREMELY WEATHERED ROCK
						4	9			REFER TO CORED BOREHOLE LOG				
						3	10							
						2	11							
						1	12							
						0	13							

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Borehole No. 207 3 / 3

CORED BOREHOLE LOG

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Core Size:** NMLC **R.L. Surface:** ~13.3 m
Date: 22/3/18 **Inclination:** VERTICAL **Datum:** AHD
Plant Type: HYDROPOWER **Bearing:** N/A **Logged/Checked By:** T.P./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	DEFECT DETAILS: SPACING (mm) (600, 200, 60, 20)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
		5			START CORING AT 8.58m						
			9		NO CORE 1.18m						
100% RETURN		4									
			10		SHALE: grey, with dark grey laminae, bedded at 0-5°.	XW	Hd				Ashfield Shale
		3				SW	M			(10.07m) J, 85 - 90°, Un, R, Cn	
						FR				(10.57m) Cr, 0 - 3°, 15 mm.t	
										(10.75m) CS, 0 - 3°, 6 mm.t	
										(10.81m) CS, 0 - 3°, 2 mm.t	
			11				M - H			(10.93m) Be, 0 - 3°, 12 mm.t	
		2								(11.40m) CS, 0 - 3°, 15 mm.t	
										(11.86m) XWS, 0 - 3°, 14 mm.t	
			12							(12.00m) J, 85°, P, S, Cn	
		1								(12.23m) XWS, 0 - 3°, 18 mm.t	
			13		END OF BOREHOLE AT 12.98 m						
		0									
			14								
		-1									

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Borehole No. 208
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BOREHOLE LOG

Client: DOWNER

Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION

Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~13.3 m

Date: 21/3/18 **Datum:** AHD

Plant Type: HYDROPOWER **Logged/Checked By:** T.P./A.J.

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
									-	ASPHALTIC CONCRETE: 40mm.t	w>PL			
						13				FILL: Silty clay, medium plasticity, grey and brown, trace of fine to coarse grained ironstone gravel, fine grained sand, slag and ash.				
									CI-CH		w>PL	VSt		ALLUVIAL
					N = 7 2,2,5					Silty CLAY: medium to high plasticity, grey mottled orange brown, trace of fine to coarse grained ironstone gravel.			220 250 210	CH4 0% LEL
ON COMPLETION OF CORING							1							
						12						Hd		
					N = 21 4,8,13								>600 >600 >600	
ON COMPLETION OF AUGERING							2							
						11			ML	SILT: low plasticity, light grey mottled orange brown, trace of clay fines.	w<PL	St		
					N = 12 2,4,8		3							
						10								
							4		CL-CI	Silty CLAY: low to medium plasticity, orange brown mottled grey, with fine to coarse grained ironstone gravel.	w>PL	St - VSt		
					N = 11 2,5,6	9							250 150 210	
							5							
						8								
					N = 12 4,5,7		6						240 180 200	
						7								

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BOREHOLE LOG

Borehole No. 208
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Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA **Method:** SPIRAL AUGER **R.L. Surface:** ~13.3 m
Date: 21/3/18 **Datum:** AHD
Plant Type: HYDROPOWER **Logged/Checked By:** T.P./A.J.

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
						6			CL-CI	Silty CLAY: low to medium plasticity, orange brown mottled grey, with fine to coarse grained ironstone gravel. *(continued)*	w>PL	St - VSt		
				■	N > 20 9,20/ 150mm REFUSAL				-	SHALE: light grey and orange brown, with clay bands.	XW	Hd		EXTREMELY WEATHERED ROCK
						5	8			REFER TO CORED BOREHOLE LOG				
						4	9							
						3	10							
						2	11							
						1	12							
						0	13							

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Borehole No.
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CORED BOREHOLE LOG

Client: DOWNER
Project: PROPOSED NEW STRATHFIELD SOUTH ZONE SUBSTATION
Location: 7-9 DUNLOP STREET, STRATHFIELD SOUTH, NSW

Job No.: 31344ZA | **Core Size:** NMLC | **R.L. Surface:** ~13.3 m
Date: 21/3/18 | **Inclination:** VERTICAL | **Datum:** AHD
Plant Type: HYDROPOWER | **Bearing:** N/A | **Logged/Checked By:** T.P./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	DEFECT DETAILS: SPACING (mm) (600, 200, 60, 20)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
		6			START CORING AT 7.92m						
100% RETURN		5	8		SHALE: grey, with iron indurated bands, and low strength bands.	XW - DW	Hd - VL				
		4	9								
		3	10		SHALE: grey, with dark grey laminae, bedded at 0-5°.	SW	M			(9.40m) J, 85 - 90°, Un, R, Cn (9.56m) XWS, 0 - 3°, 5 mm.t (9.66m) XWS, 0 - 3°, 10 mm.t (9.74m) XWS, 0 - 3°, 10 mm.t (9.75m) J, 90°, P, R, Cn (9.84m) J, 90°, P, R, Cn (9.85m) XWS, 0 - 3°, 3 mm.t (9.87m) XWS, 0 - 3°, 2 mm.t (9.89m) XWS, 0 - 3°, 4 mm.t (10.16m) XWS, 0 - 3°, 25 mm.t (10.21m) J, 85°, Un, R, Cn	Ashfield Shale
		2	11			FR				(10.74m) Be, 0°, P, S, Cn	
		1	12		END OF BOREHOLE AT 12.00 m						
		0	13								

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Appendix D: Laboratory Reports & COC Documents

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 188062

Client Details

Client	Environmental Investigation Services
Attention	Para Bokalawela
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E31344K, Strathfield South**
Number of Samples	19 Soil
Date samples received	26/03/2018
Date completed instructions received	26/03/2018

Analysis Details

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

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

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

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

Report Details

Date results requested by	04/04/2018
Date of Issue	03/04/2018

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

Results Approved By
Dragana Tomas, Senior Chemist
Jeremy Faircloth, Organics Supervisor
Long Pham, Team Leader, Metals
Paul Ching, Senior Analyst

Authorised By

Jacinta Hurst, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		188062-1	188062-2	188062-3	188062-4	188062-5
Your Reference	UNITS	BH201	BH201	BH202	BH202	BH203
Depth		0.2-0.3	0.8-1.0	0.2-0.3	1.0-1.2	0.2-0.3
Date Sampled		21/03/2018	21/03/2018	22/03/2018	22/03/2018	19/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	28/03/2018	28/03/2018	28/03/2018	28/03/2018	28/03/2018
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
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	75	87	77	79	76

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		188062-7	188062-8	188062-10	188062-13	188062-16
Your Reference	UNITS	BH205	BH205	BH205	BH207	BH207
Depth		0.1-0.2	1.0-1.1	3.4-3.5	0.2-0.3	2.9-3.0
Date Sampled		20/03/2018	20/03/2018	20/03/2018	22/03/2018	22/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	28/03/2018	28/03/2018	28/03/2018	28/03/2018	28/03/2018
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
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	77	72	72	75	75

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		188062-18
Your Reference	UNITS	BH208
Depth		0.2-0.3
Date Sampled		21/03/2018
Type of sample		Soil
Date extracted	-	27/03/2018
Date analysed	-	28/03/2018
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
naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	76

svTRH (C10-C40) in Soil						
Our Reference		188062-1	188062-2	188062-3	188062-4	188062-5
Your Reference	UNITS	BH201	BH201	BH202	BH202	BH203
Depth		0.2-0.3	0.8-1.0	0.2-0.3	1.0-1.2	0.2-0.3
Date Sampled		21/03/2018	21/03/2018	22/03/2018	22/03/2018	19/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	28/03/2018	30/03/2018	28/03/2018	28/03/2018	28/03/2018
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	%	83	84	85	85	87

svTRH (C10-C40) in Soil						
Our Reference		188062-7	188062-8	188062-10	188062-13	188062-16
Your Reference	UNITS	BH205	BH205	BH205	BH207	BH207
Depth		0.1-0.2	1.0-1.1	3.4-3.5	0.2-0.3	2.9-3.0
Date Sampled		20/03/2018	20/03/2018	20/03/2018	22/03/2018	22/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	28/03/2018	28/03/2018	28/03/2018	28/03/2018	28/03/2018
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	180	<100	<100	<100	150
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	230	<100	<100	<100	240
TRH >C_{34} -C_{40}	mg/kg	120	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	350	<50	<50	<50	240
Surrogate o-Terphenyl	%	86	84	85	83	87

svTRH (C10-C40) in Soil		
Our Reference		188062-18
Your Reference	UNITS	BH208
Depth		0.2-0.3
Date Sampled		21/03/2018
Type of sample		Soil
Date extracted	-	27/03/2018
Date analysed	-	28/03/2018
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	%	84

PAHs in Soil						
Our Reference		188062-1	188062-2	188062-3	188062-4	188062-5
Your Reference	UNITS	BH201	BH201	BH202	BH202	BH203
Depth		0.2-0.3	0.8-1.0	0.2-0.3	1.0-1.2	0.2-0.3
Date Sampled		21/03/2018	21/03/2018	22/03/2018	22/03/2018	19/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
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	<0.1	<0.1	<0.1	<0.1	0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
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	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	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
Surrogate p-Terphenyl-d14	%	106	114	106	112	106

PAHs in Soil						
Our Reference		188062-7	188062-8	188062-10	188062-13	188062-16
Your Reference	UNITS	BH205	BH205	BH205	BH207	BH207
Depth		0.1-0.2	1.0-1.1	3.4-3.5	0.2-0.3	2.9-3.0
Date Sampled		20/03/2018	20/03/2018	20/03/2018	22/03/2018	22/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Naphthalene	mg/kg	<0.1	<0.1	<0.1	0.2	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	0.2	<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	1.3	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	0.4	<0.1
Fluoranthene	mg/kg	0.2	<0.1	<0.1	1.9	<0.1
Pyrene	mg/kg	0.3	0.2	0.1	1.9	<0.1
Benzo(a)anthracene	mg/kg	0.2	<0.1	<0.1	1.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	0.6	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	1	<0.2
Benzo(a)pyrene	mg/kg	0.1	0.09	<0.05	0.97	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	0.8	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	0.2	<0.1
Benzo(g,h,i)perylene	mg/kg	0.1	0.1	0.1	0.8	<0.1
Total +ve PAH's	mg/kg	0.84	0.4	0.2	12	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	1.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	1.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	1.5	<0.5
Surrogate p-Terphenyl-d14	%	111	109	108	108	104

PAHs in Soil		
Our Reference		188062-18
Your Reference	UNITS	BH208
Depth		0.2-0.3
Date Sampled		21/03/2018
Type of sample		Soil
Date extracted	-	27/03/2018
Date analysed	-	27/03/2018
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
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
Total +ve PAH's	mg/kg	<0.05
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
Surrogate p-Terphenyl-d14	%	103

Organochlorine Pesticides in soil						
Our Reference		188062-1	188062-2	188062-3	188062-4	188062-5
Your Reference	UNITS	BH201	BH201	BH202	BH202	BH203
Depth		0.2-0.3	0.8-1.0	0.2-0.3	1.0-1.2	0.2-0.3
Date Sampled		21/03/2018	21/03/2018	22/03/2018	22/03/2018	19/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	27/03/2018	27/03/2018	28/03/2018	28/03/2018	28/03/2018
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	95	98	100	96	94

Organochlorine Pesticides in soil						
Our Reference		188062-7	188062-8	188062-10	188062-13	188062-16
Your Reference	UNITS	BH205	BH205	BH205	BH207	BH207
Depth		0.1-0.2	1.0-1.1	3.4-3.5	0.2-0.3	2.9-3.0
Date Sampled		20/03/2018	20/03/2018	20/03/2018	22/03/2018	22/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	28/03/2018	28/03/2018	28/03/2018	28/03/2018	28/03/2018
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	86	97	90	103	96

Organochlorine Pesticides in soil		
Our Reference		188062-18
Your Reference	UNITS	BH208
Depth		0.2-0.3
Date Sampled		21/03/2018
Type of sample		Soil
Date extracted	-	27/03/2018
Date analysed	-	28/03/2018
HCB	mg/kg	<0.1
alpha-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Surrogate TCMX	%	94

PCBs in Soil						
Our Reference		188062-1	188062-2	188062-3	188062-4	188062-5
Your Reference	UNITS	BH201	BH201	BH202	BH202	BH203
Depth		0.2-0.3	0.8-1.0	0.2-0.3	1.0-1.2	0.2-0.3
Date Sampled		21/03/2018	21/03/2018	22/03/2018	22/03/2018	19/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	27/03/2018	27/03/2018	28/03/2018	28/03/2018	28/03/2018
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	95	98	100	96	94

PCBs in Soil						
Our Reference		188062-7	188062-8	188062-10	188062-13	188062-16
Your Reference	UNITS	BH205	BH205	BH205	BH207	BH207
Depth		0.1-0.2	1.0-1.1	3.4-3.5	0.2-0.3	2.9-3.0
Date Sampled		20/03/2018	20/03/2018	20/03/2018	22/03/2018	22/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	28/03/2018	28/03/2018	28/03/2018	28/03/2018	28/03/2018
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	86	97	90	103	96

PCBs in Soil		
Our Reference		188062-18
Your Reference	UNITS	BH208
Depth		0.2-0.3
Date Sampled		21/03/2018
Type of sample		Soil
Date extracted	-	27/03/2018
Date analysed	-	28/03/2018
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate TCLMX	%	94

Acid Extractable metals in soil						
Our Reference		188062-1	188062-2	188062-3	188062-4	188062-5
Your Reference	UNITS	BH201	BH201	BH202	BH202	BH203
Depth		0.2-0.3	0.8-1.0	0.2-0.3	1.0-1.2	0.2-0.3
Date Sampled		21/03/2018	21/03/2018	22/03/2018	22/03/2018	19/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	28/03/2018	28/03/2018	28/03/2018	28/03/2018	28/03/2018
Arsenic	mg/kg	6	<4	5	<4	5
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	12	8	12	20	13
Copper	mg/kg	42	3	12	4	37
Lead	mg/kg	48	8	17	9	66
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	11	2	8	2	23
Zinc	mg/kg	65	5	46	5	60

Acid Extractable metals in soil						
Our Reference		188062-7	188062-8	188062-10	188062-13	188062-16
Your Reference	UNITS	BH205	BH205	BH205	BH207	BH207
Depth		0.1-0.2	1.0-1.1	3.4-3.5	0.2-0.3	2.9-3.0
Date Sampled		20/03/2018	20/03/2018	20/03/2018	22/03/2018	22/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	28/03/2018	28/03/2018	28/03/2018	28/03/2018	28/03/2018
Arsenic	mg/kg	8	6	12	<4	9
Cadmium	mg/kg	<0.4	<0.4	0.6	<0.4	6.1
Chromium	mg/kg	20	15	20	6	29
Copper	mg/kg	22	14	64	42	450
Lead	mg/kg	58	31	110	12	550
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Nickel	mg/kg	9	6	13	4	35
Zinc	mg/kg	70	28	170	51	790

Acid Extractable metals in soil			
Our Reference		188062-18	188062-20
Your Reference	UNITS	BH208	BH208 - [TRIPLICATE]
Depth		0.2-0.3	0.2-0.3
Date Sampled		21/03/2018	21/03/2018
Type of sample		Soil	Soil
Date prepared	-	27/03/2018	27/03/2018
Date analysed	-	28/03/2018	28/03/2018
Arsenic	mg/kg	6	9
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	10	12
Copper	mg/kg	11	15
Lead	mg/kg	30	22
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	5	7
Zinc	mg/kg	30	30

Moisture						
Our Reference		188062-1	188062-2	188062-3	188062-4	188062-5
Your Reference	UNITS	BH201	BH201	BH202	BH202	BH203
Depth		0.2-0.3	0.8-1.0	0.2-0.3	1.0-1.2	0.2-0.3
Date Sampled		21/03/2018	21/03/2018	22/03/2018	22/03/2018	19/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	28/03/2018	28/03/2018	28/03/2018	28/03/2018	28/03/2018
Moisture	%	14	15	16	21	18

Moisture						
Our Reference		188062-7	188062-8	188062-10	188062-13	188062-16
Your Reference	UNITS	BH205	BH205	BH205	BH207	BH207
Depth		0.1-0.2	1.0-1.1	3.4-3.5	0.2-0.3	2.9-3.0
Date Sampled		20/03/2018	20/03/2018	20/03/2018	22/03/2018	22/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	28/03/2018	28/03/2018	28/03/2018	28/03/2018	28/03/2018
Moisture	%	17	17	24	14	17

Moisture		
Our Reference		188062-18
Your Reference	UNITS	BH208
Depth		0.2-0.3
Date Sampled		21/03/2018
Type of sample		Soil
Date prepared	-	27/03/2018
Date analysed	-	28/03/2018
Moisture	%	19

Asbestos ID - soils						
Our Reference		188062-1	188062-3	188062-5	188062-7	188062-8
Your Reference	UNITS	BH201	BH202	BH203	BH205	BH205
Depth		0.2-0.3	0.2-0.3	0.2-0.3	0.1-0.2	1.0-1.1
Date Sampled		21/03/2018	22/03/2018	19/03/2018	20/03/2018	20/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	03/04/2018	03/04/2018	03/04/2018	03/04/2018	03/04/2018
Sample mass tested	g	Approx. 25g	Approx. 25g	Approx. 30g	Approx. 55g	Approx. 40g
Sample Description	-	Brown coarse-grained soil & rocks	Red coarse-grained soil & rocks	Brown coarse-grained soil & rocks	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	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	No asbestos detected

Asbestos ID - soils					
Our Reference		188062-10	188062-13	188062-16	188062-18
Your Reference	UNITS	BH205	BH207	BH207	BH208
Depth		3.4-3.5	0.2-0.3	2.9-3.0	0.2-0.3
Date Sampled		20/03/2018	22/03/2018	22/03/2018	21/03/2018
Type of sample		Soil	Soil	Soil	Soil
Date analysed	-	03/04/2018	03/04/2018	03/04/2018	03/04/2018
Sample mass tested	g	Approx. 20g	Approx. 30g	Approx. 20g	Approx. 35g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	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	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.

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	-			27/03/2018	1	27/03/2018	27/03/2018		27/03/2018	[NT]
Date analysed	-			28/03/2018	1	28/03/2018	28/03/2018		28/03/2018	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	<25	1	<25	<25	0	88	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	1	<25	<25	0	88	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	1	<0.2	<0.2	0	98	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	1	<0.5	<0.5	0	95	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	1	<1	<1	0	95	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	1	<2	<2	0	76	[NT]
o-Xylene	mg/kg	1	Org-016	<1	1	<1	<1	0	85	[NT]
naphthalene	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	88	1	75	78	4	89	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	18	27/03/2018	27/03/2018		[NT]	[NT]
Date analysed	-			[NT]	18	28/03/2018	28/03/2018		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	[NT]	18	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	[NT]	18	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-016	[NT]	18	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-016	[NT]	18	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-016	[NT]	18	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-016	[NT]	18	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-016	[NT]	18	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-014	[NT]	18	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	18	76	76	0	[NT]	[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	-			29/03/2018	1	27/03/2018	27/03/2018		27/03/2018	[NT]
Date analysed	-			29/03/2018	1	28/03/2018	30/03/2018		28/03/2018	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	1	<50	<50	0	103	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	1	<100	<100	0	94	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	1	<100	<100	0	92	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	1	<50	<50	0	103	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	1	<100	<100	0	94	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	1	<100	<100	0	92	[NT]
Surrogate o-Terphenyl	%		Org-003	80	1	83	84	1	93	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	18	27/03/2018	27/03/2018		[NT]	[NT]
Date analysed	-			[NT]	18	28/03/2018	28/03/2018		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	[NT]	18	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	[NT]	18	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	[NT]	18	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	[NT]	18	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	[NT]	18	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	[NT]	18	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-003	[NT]	18	84	84	0	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			27/03/2018	1	27/03/2018	27/03/2018		27/03/2018	[NT]
Date analysed	-			27/03/2018	1	27/03/2018	27/03/2018		27/03/2018	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	97	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	101	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	125	[NT]
Anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	99	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	101	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	84	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	1	<0.05	<0.05	0	105	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	115	1	106	102	4	120	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	18	27/03/2018	27/03/2018		[NT]	[NT]
Date analysed	-			[NT]	18	27/03/2018	27/03/2018		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-012	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-012	[NT]	18	<0.1	0.2	67	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-012	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	[NT]	18	<0.1	0.2	67	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-012	[NT]	18	<0.1	0.2	67	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	[NT]	18	<0.1	0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	[NT]	18	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	[NT]	18	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	[NT]	18	103	105	2	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			27/03/2018	1	27/03/2018	27/03/2018		27/03/2018	[NT]
Date analysed	-			27/03/2018	1	27/03/2018	27/03/2018		27/03/2018	[NT]
HCB	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	87	[NT]
gamma-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	80	[NT]
Heptachlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	74	[NT]
delta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	74	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	78	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	89	[NT]
Dieldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	95	[NT]
Endrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	85	[NT]
pp-DDD	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	72	[NT]
Endosulfan II	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	71	[NT]
Methoxychlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	84	1	95	81	16	104	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	18	27/03/2018	27/03/2018		[NT]	[NT]
Date analysed	-			[NT]	18	28/03/2018	28/03/2018		[NT]	[NT]
HCB	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-005	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	[NT]	18	94	102	8	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			27/03/2018	1	27/03/2018	27/03/2018		27/03/2018	[NT]
Date analysed	-			27/03/2018	1	27/03/2018	27/03/2018		27/03/2018	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	100	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	84	1	95	81	16	96	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	18	27/03/2018	27/03/2018		[NT]	[NT]
Date analysed	-			[NT]	18	28/03/2018	28/03/2018		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	[NT]	18	94	102	8	[NT]	[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	-			27/03/2018	1	27/03/2018	27/03/2018		27/03/2018	[NT]
Date analysed	-			28/03/2018	1	28/03/2018	28/03/2018		28/03/2018	[NT]
Arsenic	mg/kg	4	Metals-020	<4	1	6	7	15	114	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	105	[NT]
Chromium	mg/kg	1	Metals-020	<1	1	12	12	0	113	[NT]
Copper	mg/kg	1	Metals-020	<1	1	42	33	24	116	[NT]
Lead	mg/kg	1	Metals-020	<1	1	48	46	4	109	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	110	[NT]
Nickel	mg/kg	1	Metals-020	<1	1	11	11	0	112	[NT]
Zinc	mg/kg	1	Metals-020	<1	1	65	65	0	106	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	18	27/03/2018	27/03/2018		[NT]	[NT]
Date analysed	-			[NT]	18	28/03/2018	28/03/2018		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	18	6	8	29	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	18	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	18	10	12	18	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	18	11	18	48	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	18	30	15	67	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	18	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	18	5	5	0	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	18	30	22	31	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	16	27/03/2018	27/03/2018		[NT]	[NT]
Date analysed	-			[NT]	16	28/03/2018	28/03/2018		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	16	9	9	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	16	6.1	4.6	28	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	16	29	33	13	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	16	450	350	25	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	16	550	430	24	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	16	0.2	0.2	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	16	35	40	13	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	16	790	1100	33	[NT]	[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.

Report Comments

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 188062-18 for Pb. Therefore a triplicate result has been issued as laboratory sample number 188062-20.

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 requested for asbestos testing were sub-sampled from bags provided by the client.

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD	EIS Job Number: E31344K	ENVIRONMENTAL INVESTIGATION SERVICES
12 ASHLEY STREET		REAR OF 115 WICKS ROAD
CHATSWOOD NSW 2067		MACQUARIE PARK, NSW 2113
P: (02) 9910620[illegible]	Date Results Required: STANDARD	P: 02-9888 5000 F: 02-9888 5001
F: (02) 9910620[illegible]		Attention: Parra Bokalawea
Attention: Aileen	Page: 1/1	

Location: Strathfield South

Sampler: MT

Sample Preserved in Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 5a	Combo 5	Combo 6	Combo 6a	8 Metals	PAHs	TRH/BTEX	BTEX	Asbestos			
21/3/18		BH201	0.2-0.3	G, A	0	Fill	X											
↓		BH201	0.8-1.0	"	0	clay		X										
22/3/18		BH202	0.2-0.3	"	0	Fill	X											
↓		BH202	1.0-1.2	"	0	clay		X										
19/3/18		BH203	0.2-0.3	"	0	Fill	X											
19/3/18		BH203	1.5-1.8	"	0	Clay												
20/3/18		BH205	0.1-0.2	"	0	Fill	X											
		BH205	1.0-1.1	"	0	Fill	X											
		BH205	2.2-2.5	"	0	Fill												
		BH205	3.4-3.6	"	0	Fill	X											
		BH205	4.4-4.5	"	0	Fill												
		BH205	4.5-5.0	"	0	clay, silt												
22/3/18		BH207	0.2-0.3	"	0	Fill	X											
		BH207	1.0-1.1	"	0	Fill												
		BH207	1.7-2.0	"	0	Fill												
		BH207	2.9-3.0	"	0	Fill	X											
↓		BH207	4.3-4.5	"	0	clay												
21/3/18		BH208	0.2-0.3	"	0	Fill	X											
21/3/18		BH208	0.8-0.95	"	0	clay												

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

Job No: 180062
Date Received: 26.03.18
Time Received: 14:30
Received by: JE
Temp: Cool/Ambient 16.6°C
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:
MJ	26/3/18		ELS JE	26.03.18

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	Para Bokalawela

Sample Login Details

Your reference	E31344K, Strathfield South
Envirolab Reference	188062
Date Sample Received	26/03/2018
Date Instructions Received	26/03/2018
Date Results Expected to be Reported	04/04/2018

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	19 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	16.6
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:

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticidesin soil	PCBsin Soil	Acid Extractable metalsin soil	Asbestos ID - soils	On Hold
BH201-0.2-0.3	✓	✓	✓	✓	✓	✓	✓	
BH201-0.8-1.0	✓	✓	✓	✓	✓	✓		
BH202-0.2-0.3	✓	✓	✓	✓	✓	✓	✓	
BH202-1.0-1.2	✓	✓	✓	✓	✓	✓		
BH203-0.2-0.3	✓	✓	✓	✓	✓	✓	✓	
BH203-1.5-1.8								✓
BH205-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	
BH205-1.0-1.1	✓	✓	✓	✓	✓	✓	✓	
BH205-2.2-2.5								✓
BH205-3.4-3.5	✓	✓	✓	✓	✓	✓	✓	
BH205-4.4-4.5								✓
BH205-4.5-5.0								✓
BH207-0.2-0.3	✓	✓	✓	✓	✓	✓	✓	
BH207-1.0-1.1								✓
BH207-1.7-2.0								✓
BH207-2.9-3.0	✓	✓	✓	✓	✓	✓	✓	
BH207-4.3-4.5								✓
BH208-0.2-0.3	✓	✓	✓	✓	✓	✓	✓	
BH208-0.8-0.95								✓

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.

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customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 188062-A

Client Details

Client	Environmental Investigation Services
Attention	Para Bokalawela
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E31344K, Strathfield South**
Number of Samples	19 Soil
Date samples received	26/03/2018
Date completed instructions received	06/04/2018

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	11/04/2018
Date of Issue	11/04/2018

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

Results Approved By
Jeremy Faircloth, Organics Supervisor
Long Pham, Team Leader, Metals

Authorised By

Jacinta Hurst, Laboratory Manager

Metals in TCLP USEPA1311				
Our Reference		188062-A-10	188062-A-13	188062-A-16
Your Reference	UNITS	BH205	BH207	BH207
Depth		3.4-3.5	0.2-0.3	2.9-3.0
Date Sampled		20/03/2018	22/03/2018	22/03/2018
Type of sample		Soil	Soil	Soil
Date extracted	-	09/04/2018	09/04/2018	09/04/2018
Date analysed	-	09/04/2018	[NA]	09/04/2018
pH of soil for fluid# determ.	pH units	7.9	7.0	8.8
pH of soil TCLP (after HCl)	pH units	1.7	1.6	1.6
Extraction fluid used	-	1	1	1
pH of final Leachate	pH units	5.1	4.9	5.0
Lead in TCLP	mg/L	0.1	[NA]	0.2

PAHs in TCLP (USEPA 1311)		
Our Reference		188062-A-13
Your Reference	UNITS	BH207
Depth		0.2-0.3
Date Sampled		22/03/2018
Type of sample		Soil
Date extracted	-	10/04/2018
Date analysed	-	10/04/2018
Naphthalene in TCLP	mg/L	<0.001
Acenaphthylene in TCLP	mg/L	<0.001
Acenaphthene in TCLP	mg/L	<0.001
Fluorene in TCLP	mg/L	<0.001
Phenanthrene in TCLP	mg/L	<0.001
Anthracene in TCLP	mg/L	<0.001
Fluoranthene in TCLP	mg/L	<0.001
Pyrene in TCLP	mg/L	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001
Chrysene in TCLP	mg/L	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001
Total +ve PAH's	mg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	137

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.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-012	Leachates are extracted with Dichloromethane and analysed by GC-MS.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.

QUALITY CONTROL: Metals in TCLP USEPA1311						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			09/04/2018	[NT]	[NT]	[NT]	[NT]	09/04/2018	[NT]
Date analysed	-			09/04/2018	[NT]	[NT]	[NT]	[NT]	09/04/2018	[NT]
Lead in TCLP	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	[NT]	[NT]	93	[NT]

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			10/04/2018	[NT]	[NT]	[NT]	[NT]	10/04/2018	[NT]
Date analysed	-			10/04/2018	[NT]	[NT]	[NT]	[NT]	10/04/2018	[NT]
Naphthalene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	75	[NT]
Acenaphthylene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	88	[NT]
Phenanthrene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	90	[NT]
Anthracene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	97	[NT]
Pyrene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	101	[NT]
Benzo(a)anthracene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	91	[NT]
Benzo(bjk)fluoranthene in TCLP	mg/L	0.002	Org-012	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	93	[NT]
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	129	[NT]	[NT]	[NT]	[NT]	110	[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
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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.

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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customerservice@envirolab.com.au
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SAMPLE RECEIPT ADVICE

Client Details

Client	Environmental Investigation Services
Attention	Para Bokalawela

Sample Login Details

Your reference	E31344K, Strathfield South
Envirolab Reference	188062-A
Date Sample Received	26/03/2018
Date Instructions Received	06/04/2018
Date Results Expected to be Reported	11/04/2018

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	19 Soil
Turnaround Time Requested	3 days
Temperature on Receipt (°C)	16.6
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
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Sample ID	Metals in TCLP USEPA1311	PAHs in TCLP(USEPA 1311)	On Hold
BH201-0.2-0.3			✓
BH201-0.8-1.0			✓
BH202-0.2-0.3			✓
BH202-1.0-1.2			✓
BH203-0.2-0.3			✓
BH203-1.5-1.8			✓
BH205-0.1-0.2			✓
BH205-1.0-1.1			✓
BH205-2.2-2.5			✓
BH205-3.4-3.5	✓		
BH205-4.4-4.5			✓
BH205-4.5-5.0			✓
BH207-0.2-0.3	✓	✓	
BH207-1.0-1.1			✓
BH207-1.7-2.0			✓
BH207-2.9-3.0	✓		
BH207-4.3-4.5			✓
BH208-0.2-0.3			✓
BH208-0.8-0.95			✓
BH208 - [TRIPLICATE]-0.2-0.3			✓

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

Additional Info

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

Andrew Fitzsimons

From: Nancy Zhang
Sent: Friday, 6 April 2018 2:11 PM
To: Para Bokalawela
Cc: Jacinta Hurst; Samplereceipt
Subject: RE: TCLP Request --- 188062 E31344K, Strathfield South

Hi Para,

No problem.

ELS: 188062-A
Due: 11/4/18
TAT: 3 days

Regards,

Nancy Zhang | Assistant Lab Manager | Envirolab Services Pty Ltd

Great Science, Great Service.

12 Ashley Street Chatswood NSW 2067
T 612 9910 6200 **F** 612 9910 6201
E nzhang@envirolab.com.au | **W** www.envirolab.com.au

Please note that all samples submitted to the Envirolab Group laboratories will be analysed under the Envirolab Group Terms and Conditions. The Terms and Conditions are accessible by clicking this link

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From: Para Bokalawela [mailto:PBokalawela@jkgroup.net.au]
Sent: Friday, 6 April 2018 12:47 PM
To: Nancy Zhang <NZhang@envirolab.com.au>
Cc: Jacinta Hurst <JHurst@envirolab.com.au>
Subject: TCLP Request --- 188062 E31344K, Strathfield South

Hi,

Please do TCLP for the following in **3 day TAT** if possible:

- BH205 (3.4-3.5) – Lead -10
- BH207 (0.2-0.3) – B(a)P -13
- BH207 (2.9-3.0) 0 Lead -16

Regards,

Para Bokalawela

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 188074

Client Details

Client	Environmental Investigation Services
Attention	Para Bokalawela
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E31344K, Strathfield South**
Number of Samples	26 Soil
Date samples received	26/03/2018
Date completed instructions received	26/03/2018

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	04/04/2018
Date of Issue	04/04/2018

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

Results Approved By
Priya Samarawickrama, Senior Chemist

Authorised By

Jacinta Hurst, Laboratory Manager

sPOCAS + %S w/w						
Our Reference		188074-2	188074-6	188074-8	188074-9	188074-12
Your Reference	UNITS	BH202	BH202	BH203	BH203	BH203
Depth		1.0-1.2	5.8-6.0	0.5-0.95	1.8-1.95	6.3-6.5
Date Sampled		22/03/2018	22/03/2018	19/03/2018	19/03/2018	19/03/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	27/03/2018	27/03/2018	27/03/2018	27/03/2018	27/03/2018
pH $_{kcl}$	pH units	4.1	5.6	7.8	5.2	6.5
TAA pH 6.5	moles H^+ /t	61	<5	<5	<5	<5
s-TAA pH 6.5	%w/w S	0.1	<0.01	<0.01	<0.01	<0.01
pH $_{Ox}$	pH units	4.3	6.4	7.5	6.4	3.7
TPA pH 6.5	moles H^+ /t	78	<5	<5	<5	15
s-TPA pH 6.5	%w/w S	0.12	<0.01	<0.01	<0.01	0.02
TSA pH 6.5	moles H^+ /t	16	<5	<5	<5	15
s-TSA pH 6.5	%w/w S	0.03	<0.01	<0.01	<0.01	0.02
ANC_E	% $CaCO_3$	<0.05	<0.05	0.38	<0.05	<0.05
a-ANC_E	moles H^+ /t	<5	<5	75	<5	<5
s-ANC_E	%w/w S	<0.05	<0.05	0.12	<0.05	<0.05
S_{KCl}	%w/w S	0.02	<0.005	0.01	<0.005	0.01
S_P	%w/w	0.02	<0.005	0.03	<0.005	0.07
S_{POS}	%w/w	<0.005	<0.005	0.02	<0.005	0.06
a-S_{POS}	moles H^+ /t	<5	<5	14	<5	35
Ca_{KCl}	%w/w	0.1	0.01	0.25	0.08	0.14
Ca_P	%w/w	0.08	0.01	0.24	0.07	0.15
Ca_A	%w/w	<0.005	<0.005	<0.005	<0.005	0.018
Mg_{KCl}	%w/w	0.052	0.051	0.066	0.084	0.29
Mg_P	%w/w	0.040	0.047	0.063	0.077	0.31
Mg_A	%w/w	<0.005	<0.005	<0.005	<0.005	0.019
S_{HCl}	%w/w S	0.018	<0.005	<0.005	<0.005	<0.005
S_{NAS}	%w/w S	<0.005	<0.005	<0.005	<0.005	<0.005
a-S_{NAS}	moles H^+ /t	<5	<5	<5	<5	<5
s-S_{NAS}	%w/w S	<0.01	<0.01	<0.01	<0.01	<0.01
Fineness Factor	-	1.5	1.5	1.5	1.5	1.5
a-Net Acidity	moles H^+ /t	63	<5	<5	<5	22
s-Net Acidity	%w/w S	0.10	<0.01	<0.01	<0.01	0.04
Liming rate	kg $CaCO_3$ /t	4.7	<0.75	<0.75	<0.75	1.6
s-Net Acidity without -ANCE	%w/w S	0.10	<0.01	0.022	<0.01	0.040
a-Net Acidity without ANCE	moles H^+ /t	63	<5	14	<5	22
Liming rate without ANCE	kg $CaCO_3$ /t	4.7	<0.75	1.0	<0.75	1.6

sPOCAS + %S w/w				
Our Reference		188074-13	188074-18	188074-25
Your Reference	UNITS	BH203	BH205	BH207
Depth		7.5-7.85	4.4-4.5	4.3-4.4
Date Sampled		19/03/2018	20/03/2018	22/03/2018
Type of sample		Soil	Soil	Soil
Date prepared	-	27/03/2018	27/03/2018	27/03/2018
Date analysed	-	27/03/2018	27/03/2018	27/03/2018
pH $_{kcl}$	pH units	7.4	8.5	7.6
TAA pH 6.5	moles H^+ /t	<5	<5	<5
s-TAA pH 6.5	%w/w S	<0.01	<0.01	<0.01
pH $_{Ox}$	pH units	7.2	7.7	7.7
TPA pH 6.5	moles H^+ /t	<5	<5	<5
s-TPA pH 6.5	%w/w S	<0.01	<0.01	<0.01
TSA pH 6.5	moles H^+ /t	<5	<5	<5
s-TSA pH 6.5	%w/w S	<0.01	<0.01	<0.01
ANC_E	% $CaCO_3$	0.69	0.50	0.38
a-ANC_E	moles H^+ /t	140	100	75
s-ANC_E	%w/w S	0.22	0.16	0.12
S_{KCl}	%w/w S	0.01	0.02	0.007
S_P	%w/w	0.03	0.09	0.01
S_{POS}	%w/w	0.02	0.06	0.006
a-S_{POS}	moles H^+ /t	12	39	<5
Ca_{KCl}	%w/w	0.05	0.40	0.16
Ca_P	%w/w	0.07	0.37	0.18
Ca_A	%w/w	0.016	<0.005	0.021
Mg_{KCl}	%w/w	0.077	0.041	0.046
Mg_P	%w/w	0.080	0.040	0.050
Mg_A	%w/w	<0.005	<0.005	0.005
S_{HCl}	%w/w S	<0.005	<0.005	<0.005
S_{NAS}	%w/w S	<0.005	<0.005	<0.005
a-S_{NAS}	moles H^+ /t	<5	<5	<5
s-S_{NAS}	%w/w S	<0.01	<0.01	<0.01
Fineness Factor	-	1.5	1.5	1.5
a-Net Acidity	moles H^+ /t	<5	<5	<5
s-Net Acidity	%w/w S	<0.01	<0.01	<0.01
Liming rate	kg $CaCO_3$ /t	<0.75	<0.75	<0.75
s-Net Acidity without -ANCE	%w/w S	0.019	0.063	<0.01
a-Net Acidity without ANCE	moles H^+ /t	12	39	<5
Liming rate without ANCE	kg $CaCO_3$ /t	0.89	2.9	<0.75

Method ID	Methodology Summary
Inorg-064	sPOCAS determined using titrimetric and ICP-AES techniques. Based on Acid Sulfate Soils Laboratory Methods Guidelines, Version 2.1 - June 2004.

QUALITY CONTROL: sPOCAS + %S w/w						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			27/03/2018	2	27/03/2018	27/03/2018		27/03/2018	[NT]
Date analysed	-			27/03/2018	2	27/03/2018	27/03/2018		27/03/2018	[NT]
pH $_{kcl}$	pH units		Inorg-064	[NT]	2	4.1	4.1	0	91	[NT]
TAA pH 6.5	moles H^+ /t	5	Inorg-064	<5	2	61	61	0	95	[NT]
s-TAA pH 6.5	%w/w S	0.01	Inorg-064	<0.01	2	0.1	0.1	0	[NT]	[NT]
pH $_{Ox}$	pH units		Inorg-064	[NT]	2	4.3	4.4	2	106	[NT]
TPA pH 6.5	moles H^+ /t	5	Inorg-064	<5	2	78	85	9	88	[NT]
s-TPA pH 6.5	%w/w S	0.01	Inorg-064	<0.01	2	0.12	0.14	15	[NT]	[NT]
TSA pH 6.5	moles H^+ /t	5	Inorg-064	<5	2	16	24	40	[NT]	[NT]
s-TSA pH 6.5	%w/w S	0.01	Inorg-064	<0.01	2	0.03	0.04	29	[NT]	[NT]
ANC_E	% $CaCO_3$	0.05	Inorg-064	<0.05	2	<0.05	<0.05	0	[NT]	[NT]
a-ANC_E	moles H^+ /t	5	Inorg-064	<5	2	<5	<5	0	[NT]	[NT]
s-ANC_E	%w/w S	0.05	Inorg-064	<0.05	2	<0.05	<0.05	0	[NT]	[NT]
S_{KCl}	%w/w S	0.005	Inorg-064	<0.005	2	0.02	0.02	0	[NT]	[NT]
S_P	%w/w	0.005	Inorg-064	<0.005	2	0.02	0.02	0	[NT]	[NT]
S_{POS}	%w/w	0.005	Inorg-064	<0.005	2	<0.005	<0.005	0	[NT]	[NT]
a-S_{POS}	moles H^+ /t	5	Inorg-064	<5	2	<5	<5	0	[NT]	[NT]
Ca_{KCl}	%w/w	0.005	Inorg-064	<0.005	2	0.1	0.08	22	[NT]	[NT]
Ca_P	%w/w	0.005	Inorg-064	<0.005	2	0.08	0.08	0	[NT]	[NT]
Ca_A	%w/w	0.005	Inorg-064	<0.005	2	<0.005	0.005	0	[NT]	[NT]
Mg_{KCl}	%w/w	0.005	Inorg-064	<0.005	2	0.052	0.040	26	[NT]	[NT]
Mg_P	%w/w	0.005	Inorg-064	<0.005	2	0.040	0.040	0	[NT]	[NT]
Mg_A	%w/w	0.005	Inorg-064	<0.005	2	<0.005	<0.005	0	[NT]	[NT]
S_{HCl}	%w/w S	0.005	Inorg-064	<0.005	2	0.018	0.018	0	[NT]	[NT]
S_{NAS}	%w/w S	0.005	Inorg-064	<0.005	2	<0.005	<0.005	0	[NT]	[NT]
a-S_{NAS}	moles H^+ /t	5	Inorg-064	<5	2	<5	<5	0	[NT]	[NT]
s-S_{NAS}	%w/w S	0.01	Inorg-064	<0.01	2	<0.01	<0.01	0	[NT]	[NT]
Fineness Factor	-	1.5	Inorg-064	<1.5	2	1.5	1.5	0	[NT]	[NT]
a-Net Acidity	moles H^+ /t	5	Inorg-064	<5	2	63	64	2	[NT]	[NT]
s-Net Acidity	%w/w S	0.01	Inorg-064	<0.01	2	0.10	0.10	0	[NT]	[NT]
Liming rate	kg $CaCO_3$ /t	0.75	Inorg-064	<0.75	2	4.7	4.8	2	[NT]	[NT]
s-Net Acidity without -ANCE	%w/w S	0.01	Inorg-064	<0.01	2	0.10	0.10	0	[NT]	[NT]
a-Net Acidity without ANCE	moles H^+ /t	5	Inorg-064	<5	2	63	64	2	[NT]	[NT]

QUALITY CONTROL: sPOCAS + %S w/w						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Liming rate without ANCE	kg $CaCO_3$/t	0.75	Inorg-064	<0.75	2	4.7	4.8	2	[NT]	[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: E31344K	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) 9910620	Page: 1/2	Attention: Parra Bokalawea
Attention: Aileen		

Location: Strathfield South

Sampler: TP

Sample Preserved in Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Specs										
22/3/18	1	BH202	0.2-0.3	P	NA	Fill											
	2	BH202	1.0-1.2			silty clay	X										
	3	BH202	2.2-2.4														
	4	BH202	3.3-3.45														
	5	BH202	4.3-4.5														
	6	BH202	5.8-6.0				X										
	7	BH202	7.3-7.5														
19/3/18	8	BH203	0.5-0.65	P	NA	Fill	X										
	9	BH203	1.5-1.95			silty clay	X										
	10	BH203	3.0-3.45														
	11	BH203	4.5-4.95														
	12	BH203	6.3-6.45				X										
	13	BH203	7.5-7.85				X										
20/3/18	14	BH205	0-0.05			Fill											
	15	BH205	1.0-1.5			Fill											
	16	BH205	2.0-2.5			Fill											
	17	BH205	3.4-3.5			Fill											
	18	BH205	4.4-4.5			clay/silt	X										
	19	BH205	5.5-6.0			silty clay											
	20	BH205	7.2-7.5			"											
22/3/18	21	BH207	0.2-0.3			Fill											
	22	BH207	1.0-1.1			Fill											
	23	BH207	1.9-2.0			Fill											
	24	BH207	2.9-3.0			Fill											
	25	BH207	4.3-4.4			silty clay	X										

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

Job No: 188074

Date Received: 26/3/18

Time Received: 15:00

Received by: JE

Temp: Cool/Ambient 0.5°C

Cooling: Ice/Ice Pack

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:
MO	26/3/18		ELS JE	26/3/18

19074

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD	EIS Job Number: E31344K	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: 2/2	Attention: Parra Bokalawea
Attention: Aileen		

Location: Strathfield South

Sampler: TB

Sample Preserved in Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Spocas										
22/3/18	26	BH207	0.0-0.5	A	—	silty clay											

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:
MD	26/3/18.		ELS JE	26/3/18

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	Para Bokalawela

Sample Login Details

Your reference	E31344K, Strathfield South
Envirolab Reference	188074
Date Sample Received	26/03/2018
Date Instructions Received	26/03/2018
Date Results Expected to be Reported	04/04/2018

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	26 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	0.5
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	sPOCAS + %S w/w	On Hold
BH202-0.2-0.3		✓
BH202-1.0-1.2	✓	
BH202-2.2-2.4		✓
BH202-3.3-3.45		✓
BH202-4.3-4.5		✓
BH202-5.8-6.0	✓	
BH202-7.3-7.5		✓
BH203-0.5-0.95	✓	
BH203-1.8-1.95	✓	
BH203-3.0-3.45		✓
BH203-4.5-4.95		✓
BH203-6.3-6.5	✓	
BH203-7.5-7.85	✓	
BH205-0.4-0.5		✓
BH205-1.4-1.5		✓
BH205-2.0-2.5		✓
BH205-3.4-3.5		✓
BH205-4.4-4.5	✓	
BH205-5.5-6.0		✓
BH205-7.2-7.5		✓
BH207-0.2-0.3		✓
BH207-1.0-1.1		✓
BH207-1.9-2.0		✓
BH207-2.9-3.0		✓
BH207-4.3-4.4	✓	
BH207-6.0-6.45		✓

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 188074-A

Client Details

Client	Environmental Investigation Services
Attention	Para Bokalawela
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E31344K, Strathfield South**
Number of Samples	26 Soil
Date samples received	26/03/2018
Date completed instructions received	23/04/2018

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	26/04/2018
Date of Issue	26/04/2018

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Results Approved By
Nick Sarlamis, Inorganics Supervisor

Authorised By

Jacinta Hurst, Laboratory Manager

SCr			
Our Reference		188074-A-12	188074-A-18
Your Reference	UNITS	BH203	BH205
Depth		6.3-6.5	4.4-4.5
Date Sampled		19/03/2018	20/03/2018
Type of sample		Soil	Soil
Date prepared	-	26/04/2018	26/04/2018
Date analysed	-	26/04/2018	26/04/2018
Chromium Reducible Sulfur	%w/w	0.006	0.05
a-Chromium Reducible Sulfur	moles H^+ /t	4	33

Method ID	Methodology Summary
Inorg-068	Chromium Reducible Sulfur - Hydrogen Sulfide is quantified by iodometric titration after distillation to determine potential acidity. Based on Acid Sulfate Soils Laboratory Methods Guidelines, Version 2.1 - June 2004.

QUALITY CONTROL: SCr						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			26/04/2018	[NT]	[NT]	[NT]	[NT]	26/04/2018	[NT]
Date analysed	-			26/04/2018	[NT]	[NT]	[NT]	[NT]	26/04/2018	[NT]
Chromium Reducible Sulfur	%w/w	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	104	[NT]
a-Chromium Reducible Sulfur	moles H^+ /t	3	Inorg-068	<3	[NT]	[NT]	[NT]	[NT]	[NT]	[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.

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	Para Bokalawela

Sample Login Details

Your reference	E31344K, Strathfield South
Envirolab Reference	188074-A
Date Sample Received	26/03/2018
Date Instructions Received	23/04/2018
Date Results Expected to be Reported	26/04/2018

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	26 Soil
Turnaround Time Requested	2 days
Temperature on Receipt (°C)	0.5
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	SCr	On Hold
BH202-0.2-0.3		✓
BH202-1.0-1.2		✓
BH202-2.2-2.4		✓
BH202-3.3-3.45		✓
BH202-4.3-4.5		✓
BH202-5.8-6.0		✓
BH202-7.3-7.5		✓
BH203-0.5-0.95		✓
BH203-1.8-1.95		✓
BH203-3.0-3.45		✓
BH203-4.5-4.95		✓
BH203-6.3-6.5	✓	
BH203-7.5-7.85		✓
BH205-0.4-0.5		✓
BH205-1.4-1.5		✓
BH205-2.0-2.5		✓
BH205-3.4-3.5		✓
BH205-4.4-4.5	✓	
BH205-5.5-6.0		✓
BH205-7.2-7.5		✓
BH207-0.2-0.3		✓
BH207-1.0-1.1		✓
BH207-1.9-2.0		✓
BH207-2.9-3.0		✓
BH207-4.3-4.4		✓
BH207-6.0-6.45		✓

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.

Andrew Fitzsimons

From: Nancy Zhang
Sent: Monday, 23 April 2018 3:56 PM
To: Samplereceipt
Cc: Ken Nguyen
Subject: FW: 48hr TAT --- Additional Analysis Request --- 188074 E31344K, Strathfield South

ELS: 188074-A
TAT: 2 days
Due: 26/4/18

Regards,

Nancy Zhang | Assistant Lab Manager | Envirolab Services Pty Ltd

Great Science, Great Service.

12 Ashley Street Chatswood NSW 2067
T 612 9910 6200 **F** 612 9910 6201
E nzhang@envirolab.com.au | **W** www.envirolab.com.au

Please note that all samples submitted to the Envirolab Group laboratories will be analysed under the Envirolab Group Terms and Conditions. The Terms and Conditions are accessible by clicking this link

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From: Para Bokalawela [mailto:PBokalawela@jkgroup.net.au]
Sent: Monday, 23 April 2018 3:41 PM
To: Ken Nguyen <KNguyen@envirolab.com.au>; enquiries <enquiries@envirolab.com.au>
Subject: 48hr TAT --- Additional Analysis Request --- 188074 E31344K, Strathfield South

Hi,

Please analyse following two samples for "Scr – Chromium reducible" in **48hr TAT**:

- BH203 (6.3-6.5) - 12
- BH205 (4.4-4.5) - 18

Regards,

Para Bokalawela
Senior Environmental Engineer

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F: +612 9888 5001
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www.jkgroup.net.au